

**BIOLOGICAL EVALUATION  
OF  
FOREST MANAGEMENT ACTIVITIES PROPOSED  
FOR**

**ANALYSIS UNIT 23  
(Compartments 253, 254, 255, 256, 257 and 259)  
Gloster and Crosby Quadrangles**

**USDA Forest Service  
Southern Region (8)  
National Forests in Mississippi  
Homochitto National Forest  
Homochitto Ranger District  
Mississippi**

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Date 27 Sep 2010

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## Introduction

This Biological Evaluation (BE) documents the likely impacts on proposed, endangered, threatened, and sensitive (TES) species from forest management activities proposed for Analysis Unit 23. AU 23 is located in Amite and Wilkinson counties, Mississippi and is part of the Foster Creek subwatershed in the Homochitto River basin..

As a result of a recent court decision, Forest Plan Amendment # 16 and the Region 8 Supplement to FSM 2670 are no longer in effect. This BE follows the process used to decide when to inventory for TES species that is consistent with the requirement found in the Vegetation Management EIS for the Coastal Plain and Piedmont.

This BE is in accordance with direction given in Forest Service Manual (FSM) 2672 to meet the 1989 Vegetation Management standard. As part of the NEPA decision making process, the BE provides a review of Forest Service (FS) activities in sufficient detail to determine how an action will affect any TES species. TES species, taken from both state and federal lists, are species whose viability is most likely to be put at risk from management actions.

The BE has three primary objectives: 1) Ensure FS actions do not contribute to loss of viability of any native or desired non-native plant or animal species. 2) Incorporate concerns for sensitive species throughout the planning process, reducing negative impacts to species and enhancing opportunities for mitigation. 3) Ensure that activities will not cause a species to move toward federal listing. Consideration by decision makers of the information contained in this BE will ensure that no species is placed in jeopardy by management actions.

The Regional Forester's list of "sensitive" species for the National Forests in Mississippi (USDA 2001) and National Forests in Mississippi Threatened and Endangered Species List (USDA 2006) were reviewed to devise a target list of TES species for the Homochitto Ranger District, Homochitto National Forest. Two federally listed and 20 sensitive species are confirmed, likely to occur, or have the potential to occur on the Homochitto National Forest (Table 1).

Table 1. TES taxa recorded from or likely to occur on the Homochitto Ranger District

Common Name	Scientific Name	Status*			Occurrence
		USFWS	FS	State	
Louisiana black bear	<i>Ursus americana luteolus</i>	T		S3	Potential
Red-cockaded woodpecker	<i>Picoides borealis</i>	E		S1	Confirmed
Webster's salamander	<i>Plethodon websteri</i>		S	S3	Possible
Bald eagle	<i>Haliaeetus leucocephalus</i>		S	S1	Confirmed
Bachman's sparrow	<i>Aimophila aestivalis</i>		S	S3	Confirmed
Pearl blackwater crayfish	<i>Procambarus penni</i>		S	S3	Confirmed
Alabama shad	<i>Alosa alabamiae</i>		S		Unlikely
Crystal darter	<i>Ammocrypta asprella</i>		S	S2	Unlikely
Broadstripe topminnow	<i>Fundulus euryzonus</i>		S	S2	Unlikely
Natchez stonefly	<i>Alloperla natchez</i>		S	S2	Confirmed
Chukcho stonefly	<i>Haploperla chukcho</i>		S	S2	Confirmed
Rayed creekshell	<i>Anodontoides radiatus</i>		S	S2	Unlikely
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>		S	S3	Confirmed
Southeastern myotis	<i>Myotis austroriparius</i>		S1	S1	Confirmed
Arogos skipper	<i>Atrytone arogos arogos</i>		S	S2S3	Possible
trachyxiphium moss	<i>Trachyxiphium heteroicum</i>		S	S1	Confirmed
Cypress-knee sedge	<i>Carex decomposita</i>		S	S3	Confirmed
Small's woodfern	<i>Dryopteris X australis</i>		S	S1	Confirmed
Bay starvine	<i>Schisandra glabra</i>		S	S3	Confirmed
Carolina fluffgrass	<i>Tridens carolinianus</i>		S	S3S4	Confirmed
Fetid trillium	<i>Trillium foetidissimum</i>		S	S3	Confirmed
Ravine sedge	<i>Carex impressinervia</i>		S	S1	Confirmed

\* See Appendix 3 for explanation of codes.

This list is based on documented occurrences, habitat presence/suitability within or near the National Forest boundaries, and the geographic range of TES species gathered from the records of the Mississippi Natural Heritage Program and other credible sources (i.e., literature reviews, conversations with knowledgeable biologists, etc.). See Appendices 1 and 2. Table 1 depicts the 22 TES taxa considered in this Biological Evaluation.

Potential risks resulting from management actions were assessed by referring to available occurrence records and to information on the general biology of these species obtained from survey reports, the Mississippi Natural Heritage Program and the scientific literature.

**DETERMINATION OF EFFECTS**

Table 2. Summary of determination of effects

Species	Determination based on the Proposed Action, Alt 2	Determination based on Alternative 3	Determination based on the No Action Alternative
Louisiana Black Bear	NLAA	NLAA	NE
Red-cockaded woodpecker	NLAA (beneficial)	NLAA (beneficial)	NLAA (long term negative)
Webster's salamander	MII	MII	NI
Bald Eagle	NI	NI	NI
Bachman's sparrow	MII (short term)	MII (short term)	MII (long term)
Pearl blackwater crayfish	MII (short term)	MII (short term)	NI
Alabama shad	NI	NI	NI
Crystal darter	NI	NI	NI
Broadstripe topminnow	NI	NI	NI
Natchez stonefly	MII (short term)	MII (short term)	NI
Chukcho stonefly	MII (short term)	MII (short term)	NI
Rayed creekshell	NI	NI	NI
Rafinesque's big-eared bat	MII	MII	NI
Southeastern myotis	NI	NI	NI
Arogos skipper	MII (short term/long term beneficial)	MII (short term/long term beneficial)	NI (short term)
Trachypodium heteroicum (moss)	NI	NI	NI
Cypress-knee sedge	NI	NI	NI
Small's woodfern	NI	NI	NI
Bay starvine	MII	MII	NI
Carolina fluffgrass	MII	MII	NI
Fetid trillium	MII	MII	NI
Ravine sedge	MII	MII	NI

Threatened and Endangered Species

NE = No Effect, NLAA = Not likely to adversely affect, LAA = Likely to adversely affect

Sensitive Species

NI = No Impact

MII = May impact individuals but not likely to cause a trend to federal listing or a loss of viability

BI = Beneficial impact

L = Likely to result in a trend to federal listing or loss of viability

**Purpose and Need**

The purpose for these management actions is to improve the present landscape community to meet the desired conditions of the Forest Plan. The Homochitto National Forest has been identified by the USDI Fish and Wildlife as a secondary core recovery population for the management of red-cockaded woodpecker (RCW). This designation and direction found in the recovery plan for this species also helps determine the desired future condition of the forest. This proposal is designed to improve the conditions for the management of the red-cockaded woodpecker ecosystem; improve the overall forest health of the project area; and provide a spectrum of dispersed and developed recreation while supplying sufficient wildlife habitat.

The desired future conditions of red-cockaded woodpecker ecosystems are vegetation conditions that are primarily a product of frequent prescribed fire, longleaf pine restoration harvests and red-cockaded woodpecker habitat improvement practices producing scattered, moderate openings in an open pine canopy. Restoration focuses on sustaining longleaf pine and its associated ground cover, while restoring areas now dominated by other pine species to longleaf communities over an extended period. Along with red-cockaded woodpecker management, the following objectives were developed for this project in order to provide direction and define the goal that the Forest Service is working to accomplish:

- Improvement of forest health through thinning and regeneration of aging stands to increase growth of residual trees and reduce southern pine beetle risk.
- Restoration of fire dependent ecosystem which favors longleaf pine.
- Habitat improvement and reduction of hazardous fuels through the use of prescribed fire.
- Promoting the establishment and growth of hard mast species on appropriate sites.
- Implement multi-use goals and objectives for long term land and resource management.
- Provide a spectrum of dispersed and developed recreational opportunities.
- Supply wildlife habitats that may include wildlife openings, nest boxes, inserts and ephemeral ponds.
- Provide a relatively high degree of age class and site diversity to increase forest heterogeneity and ecosystem diversity-early, mid, late seral habitats

The proposed management actions are needed at this point to improve forest health; and to bring the current conditions of the forest closer to the desired conditions of the Homochitto National Forest. Regeneration methods will assist in balancing the age class distribution and providing future habitat that may be suitable for red-cockaded woodpecker foraging and nesting. Thinning will help in obtaining a healthy forest and developing the desired population objectives. Forests in areas of high densities become suppressed and are more susceptible to beetle infestations, which subsequently deprives red-cockaded woodpecker of adequate habitat. Thinning in the younger pine stands will assist in maintaining healthy, growing forest and work toward providing more suitable habitat for red-cockaded woodpecker foraging.

Prescribed burning for site preparation activities would reduce woody vegetation competition for the planted seedlings. Herbicide release in the young longleaf stands further reduces competition and gives the longleaf seedlings the opportunity to start height growth. Competition from noxious and invasive plant species would be decreased with the use of herbicides.

Hardwood midstory removal practices, installing red-cockaded woodpecker inserts in clusters along with thinning and more growing season burns will all aid in providing the desired open park-like conditions and attaining the goal of 254 active clusters on the Homochitto National Forest.

### **Affected Area and Proposed Action**

The Homochitto National Forest is proposing management actions to occur over the next 10 years within Analysis Unit 23 (AU 23) to achieve the goals and objectives of the Land and Resource Management Plan (Forest Plan), National Forest of Mississippi. The Homochitto National Forest is located in the southwest corner of the state and is between the cities of Natchez to the west and Brookhaven to the east. AU 23 is located in Amite and Wilkinson counties and is part of the Foster Creek subwatershed. The analysis area includes compartments

253, 254, 255, 256, 257, and 259. Compartments 253 and 254 are southwest and west of Crosby, Mississippi, respectively. The remaining compartments are north of Gloster, Mississippi (Figure 1). The analysis area contains approximately 5,377 acres of National Forest land and approximately 8,060 acres of private land for a total of approximately 13,445 acres. Approximately 8,060 acres of private land within Analysis Unit 23 are not included within the modified proposed action and alternatives, but were considered in the analysis of the direct, indirect, and cumulative effects of these actions within and adjacent to Analysis Unit 23.

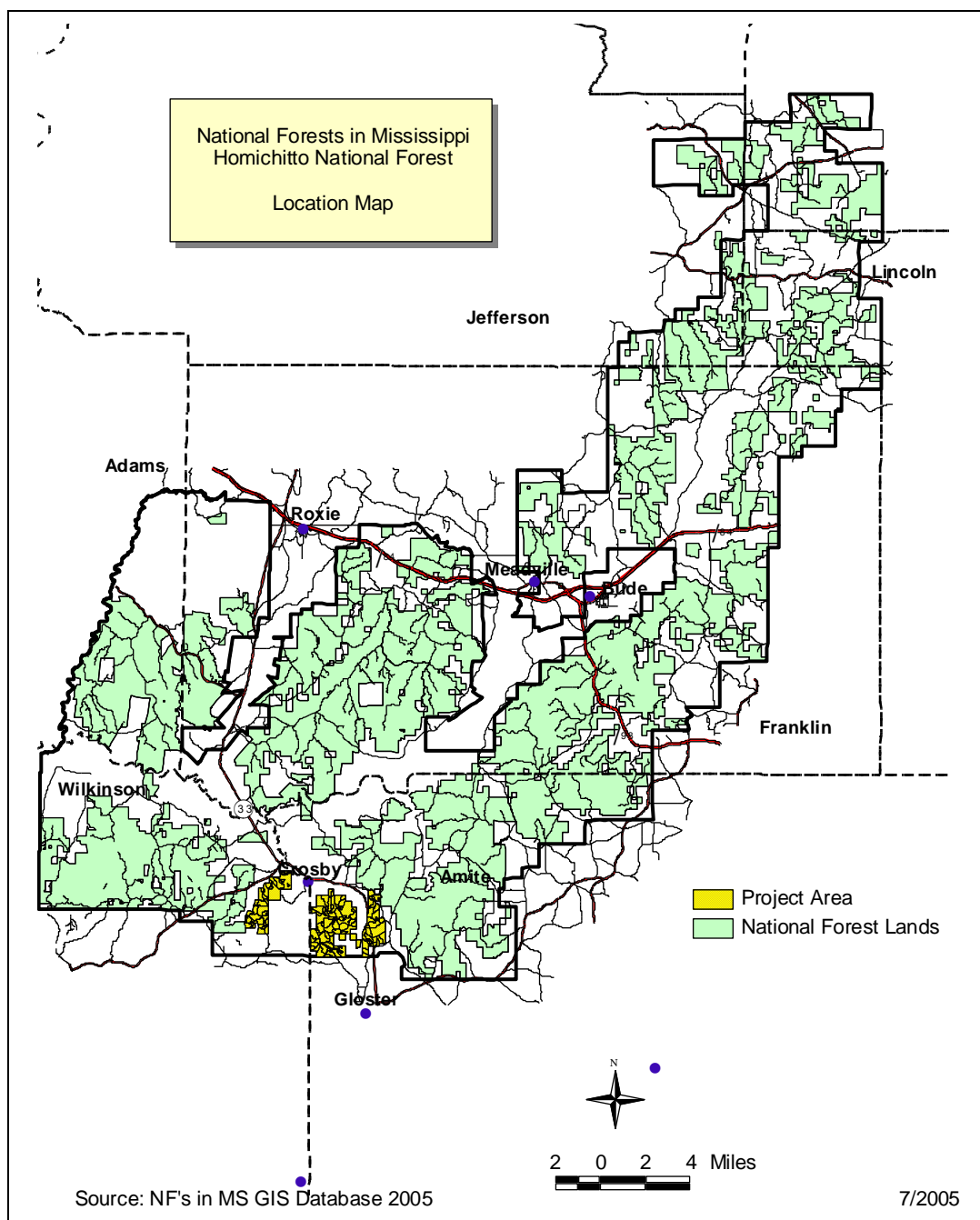


Figure 1 Vicinity Map

A more specific set of compartment locations is in Table 3

**Table 3: Compartment Locations\***

Compartment	Township	Range	Section(s)
253	3, 4 North	1 East	3, 40
254	4 North	1 East	40, 41, 32
255	4 North	2 East	6, 7, 8
256	3, 4 North	2 East	34, 35, 5, 6
257	3, 4 North	2 East	8, 9, 5, 35
259	3, 4 North	2 East	36, 4, 3, 9, 1

The Project Interdisciplinary Team (IDT) selected Alternative 3 as the Preferred Alternative. Alternative 3 was developed in response to concerns that a more accelerated Alternative to return the red-cockaded woodpecker to the project area was needed. This alternative was developed not only to meet the goals and objectives of the Forest Plan, but also to amend the current Forest Plan in order to meet the direction of the *Recovery Plan for the Red-cockaded Woodpecker (Picoides borealis): Second Edition (Recovery Plan)* issued by the USDI Fish and Wildlife Service (USFWS), Southeast Region. Alternative 3 was developed to maximize red-cockaded woodpecker foraging habitat and nesting habitat. A comparison of the proposed treatments under these alternatives is given below. Treatments in both action alternatives are similar, although amounts and locations of critical treatments vary. The locations of proposed treatments in Alternative 3 are presented on the attached map.



**Table 4. Proposed actions and treatment acres for Alternatives**

Proposed Activity	No-Action	Alternative 2	Alternative 3
Project Area	5377 acres	5377 acres	5377 acres
Longleaf Restoration cut	0 acres	342 acres	396 acres
Shelterwood Method	0 acres	440 acres	174 acres
Thinning: First Intermediate	1018 acres* 0 acres	407 acres (1425) 1967 acres	560 acres (1578) 1341 acres
RCW Midstory Work	0 acres	118 acres	1332 acres
Site Prep. – Herbicide/Burn	0 acres	782 acres	570 acres
Planting Longleaf	0 acres	342 acres	396 acres
Release	0 acres	782 acres	570 acres
Pre-commercial Thin	0 acres	782 acres	570 acres
RCW cavity inserts	0 Inserts	84 Inserts	84 inserts
Ephemeral pond construction	0 ponds	55 ponds	55 ponds
Bat boxes	0 boxes	222 boxes	222 boxes
System road construction	0 miles	0 miles	1.2 miles
System road improvement	0 miles	23 miles	20.2 miles
Temporary road construction	0 miles	5.5 miles	5 miles
Late seral designation	231 acres	452 acres	441 acres
0-10 age class	0 acres	782 acres; 14%	570 acres; 11%
* Acres from First Thinning EA, applied to all alternatives ( )			

**Proposed Actions for Alternative 3 are presented in more detail:**

**Longleaf restoration clear-cut** is proposed for approximately 396 acres of loblolly pine forest. The average age of the stands is 94 years. Shelterwood cut with reserves is proposed for 174 acres of loblolly pine forest located outside the burn block (and thus not feasible to be regenerated to longleaf pine) to improve age class distribution in the Analysis Unit. **Site preparatory** work in regeneration sites would consist of using mechanical/chemical treatments followed by a prescribe burn. Follow-up treatments would include **release** and/or **pre-commercial thinning** to release the longleaf pine seedlings from competition using prescribed burning (also a preventative treatment for brownspot), herbicide, and /or mechanical treatments. **Site prep burns** are proposed for 570 acres of regeneration within AU-23. **Planting of longleaf pine** is proposed for the 396 acres proposed for restoration clear-cut.

**Crown thinning** (1<sup>st</sup> thin) is proposed for approximately 560 acres of pine stands with an average age of 17 years. The proposed thinning harvest will decrease competition between trees and will release trees for improved growth. Thinning will reduce the susceptibility of the stands to damage from insects and disease, and more quickly provide adequate future foraging habitat for the red-cockaded woodpeckers. An additional 1018 acres within the project area are

proposed for thinning within the 2005 First Thinning Project. The effects of this project may be found in its related documents.

The **intermediate thinning** is proposed for approximately 1341 acres of pine and pine hardwood. The stands have high stocking densities. These stands also do not meet the required habitat conditions of red-cockaded woodpeckers, which favors widely spaced mature pine, with little or no hardwood-pine midstory. Thinning at this time would maximize the potential for red-cockaded woodpecker introduction and survival in recruitment stands and habitat rehabilitation in other stands.

**Hardwood midstory removal** is proposed for approximately 1332 acres within the project area to increase foraging and nesting opportunities for red-cockaded woodpeckers. Midstory removal would consist of chemical and/or mechanical treatments.

**Wildlife habitat improvements** would consist of constructing ephemeral ponds, placing bat boxes near these ponds and the mowing of roads closed after harvest to control undesirable woody species maintain wildlife habitat. Ephemeral ponds are found in a variety of positions on the landscape, but to maximize wildlife benefits, ponds will be built adjacent to old logging roads, gated roads, small openings, or log landings. Ephemeral ponds can be spaced fairly close together (a maximum of one every 100 acres) but should be no larger than 1/10 of an acre to considerably less. Ephemeral ponds should be no deeper than 3 feet and have gently sloping sides. Soil needs to have adequate clay content to hold water. Three to five bat boxes will be placed at each ephemeral pond. These ponds provide feeding habitat for bats and also provide a water source. Bat houses will provide additional roosting sites in areas that are lacking this type of habitat. Additional habitat improvement activities, specifically for the red-cockaded woodpeckers includes the installation of 84 artificial red-cockaded woodpeckers nest cavities.

**System road improvements** are proposed for approximately 20.2 miles of Forest Service roads throughout the project area in order to access stands with logging equipment and protect the soil and water resources. Approximately 5 miles of **temporary road construction** will be needed during harvesting operations. System road construction is proposed for 1.2 miles of Forest Service roads. Erosion control activities would be implemented to stabilize exposed soil on skid trails, landings, and temporary roads used during harvesting activities after the completion of the harvest.

The goal of the National Forests in Mississippi is to have 2.5% of the suitable land base to be considered as **late seral** (Forest Plan, p. 4-6). Late seral stands are areas set aside for large size trees, 18"-26" dbh. Approximately 441 acres are designated late seral.

A key feature of Alternative 3 is the adoption of Amendment 19 to the Forest Plan. The increased acreage of longleaf pine habitat restoration is only possible with this Amendment.

In May of 1990 the National Forests in Mississippi Forest Plan was amended (Amendment #8) to incorporate The Interim Standards and Guidelines for the Protection and Management of red-cockaded woodpecker Habitat within  $\frac{3}{4}$  mile of Colony Sites. These interim guidelines were developed consistent with the first revision of the red-cockaded woodpecker Recovery Plan

approved on April 11, 1985. In June 1995 the Forest Plan was amended again (Amendment #14) to designate our tentative HMA and outline direction on select silvicultural treatments to be applied outside the  $\frac{3}{4}$  mile zone. The USFWS approved a second revision of the red-cockaded woodpecker Recovery on January 27, 2003, prompting the need to modify the original interim guidance to conform to revised red-cockaded woodpecker habitat management guidance in the 2003 red-cockaded woodpecker Recovery Plan.

The Interim Standards and Guidelines for the Protection and Management of RCW Habitat within  $\frac{3}{4}$  mile of Colony Sites no longer reflect the latest science regarding red-cockaded woodpecker habitat management and species recovery. The USFWS 2003 RCW Recovery Plan outlines the actions, to the best current understanding, necessary to recover red-cockaded woodpeckers. Implementation is accomplished through incorporation of management guidelines identified in the Recovery Plan Revision into agency decision documents. This proposed action (Amendment 19), within the Homochitto tentative HMA, presents an opportunity to incorporate this revised direction on the Homochitto National Forest.

### **Desired Condition**

The desired condition is that all references to red-cockaded woodpecker management be based on the most current information for the successful recovery of the species (USFWS 2003 RCW Recovery Plan).

### **Need for Change**

Currently, the Interim Standards and Guides limit our restoration efforts within the  $\frac{3}{4}$ -mile cluster radius to a maximum of 25 acres of regeneration. Not more than 25% of the area (in the  $\frac{3}{4}$ -mile zone) can be less than 30 years old post-treatment and 8.5% cannot be less than 10 years old post-treatment. The Recovery Plan (2003) allows up to 40 acres of restoration in the  $\frac{1}{2}$ -mile radius and 80 acres of restoration one mile away from an active/recruitment cluster. An example of this in regards to AU-23 can be seen in the table below:

**Table 5 Comparison of Restoration/Regeneration Allowable in the RCW HMA for AU-23 \***

<b>Guiding Document</b>	<b>Restoration to longleaf</b>	<b>Loblolly Regeneration</b>	<b>Total</b>
Interim Standards and Guides	330	587	<b>905</b>
USFWS Recovery Plan (2003)	589	640	<b>1229</b>

\*These are maximum allowable prior to foraging calculations

As our loblolly pine forests continues to reach or exceed rotation age it is essential that we have the flexibility to manage our habitat in a manner that benefits the red-cockaded woodpecker in the long-term.

Paramount to our restoration effort is a need to provide good quality foraging habitat. Guidance for the current process to conduct foraging analyses comes from the 1989 USFWS Guidelines for Preparation of Biological Assessments and Evaluations for the Red-cockaded woodpecker. Since this time, the USFWS has released new guidelines that are more comprehensive, use the latest available science, and account for the quality of the foraging habitat.

The purpose and need of this amendment is to update the Forest Plan to incorporate The Red-cockaded Woodpecker (*Picoides borealis*) Recovery Plan (Second Revision) as it applies to the Homochitto National Forest. In doing so, the guidance referenced in The Interim Standards and Guidelines for the Protection and Management of red-cockaded woodpecker Habitat within  $\frac{3}{4}$  mile of Colony Sites as well as forest plan guidelines specific to red-cockaded woodpecker management will be replaced by updated strategies in the revised recovery plan.

The revised red-cockaded woodpecker Recovery Plan describes the primary actions needed to accomplish delisting and downlisting recovery goals: (1) application of frequent fire to both clusters and foraging habitat; (2) protection and development of large, mature pines throughout the landscape; (3) protection of existing cavities and judicious provisioning of artificial cavities; (4) provision of sufficient recruitment clusters in locations chosen to enhance the spatial arrangement of groups, and (5) restoration of sufficient habitat quality and quantity to support the large populations necessary for recovery.

The following table summarizes the existing references to guidance for the successful recovery and management of red-cockaded woodpecker populations and the changes needed to meet the desired condition.

**Table 6 Comparison of existing Plan Direction with proposed Changes (Amendment 19)**

#	Existing RCW Direction	Description	Needed change to meet Desired Condition
1	1985 Forest Plan, Interim Standards and Guides by Amendment #8	General reference for source of RCW recovery guidance.	Reference most current RCW Recovery Plan.
2	1985 Forest Plan, Interim Standards and Guides by Amendment #14	Silvicultural treatments within the HMA but outside the ¾ mile zone.	Reference most current RCW Recovery Plan.
3	1985 Forest Plan, pages 4-7, 4-8	Manage to attain a goal of four RCW colonies per 1,000 acres of suitable habitat.	Reference most current RCW Recovery Plan, page 156.
4	1985 Forest Plan, #1, page 4-7	Manage longleaf pine working group on an 80-year rotation in each compartment.	Reference RCW Recovery Plan, General Guidelines for Silviculture. Pages 198-200.
5	1985 Forest Plan, #1, page 4-7	Manage other pine working groups or their equivalent on a 70-year rotation.	Reference RCW Recovery Plan, General Guidelines for Silviculture. Pages 198-200.
6	1985 Forest Plan #2, Page 4-7	Provide at least 125 acres of foraging habitat 30 years old or older connected to and within ½-mile of all active colonies and replacement/recruitment stands. 40% of the acreage in each foraging area should be 60 years plus if available.	Reference RCW Recovery Plan Foraging Guidelines, pages 188-189.
7	1985 Forest Plan, #3, page 4-7	Establish 10-acre replacement/recruitment stand for each existing colony and for each additional colony required to meet population objective. These stands should be at least 60 years old.	Reference RCW Recovery Plan guidelines on recruitment clusters. Remove "Replacement Stands".

Table 6. (Continued)

#	Existing RCW Direction	Description	Needed change to meet Desired Condition
8	1985 Forest Plan, #4, page 4-7	The colony site and replacement/recruitment stand can be part of the foraging habitat if it meets the qualifications.	Reference RCW Recovery Plan guidelines on recruitment clusters.
9	1985 Forest Plan, #5, page 4-7	Since the replacement stand is located within the foraging habitat of an existing colony, no additional foraging habitat needs to be provided.	Reference RCW Recovery Plan guidelines on recruitment clusters.

The second revision of the Red-Cockaded Woodpecker Recovery Plan identifies a large number of changes and clarification of protocols associated with RCW management. For example Appendices 2, 3 and 4 present protocols for monitoring reproduction, group compositions, translocations and RCW surveys. These (and other) changes and clarifications in the Recovery Plan are expected to become the means by which the Forest Plan standards and guidelines are implemented, and evaluated. Such measures are impossible to fully list, as many times they are only minor variations on existing processes, procedures and protocols. In other cases, such as foraging standards, they represent a new and/or different way of evaluating foraging habitat. However, the revised Recovery Plan is expected to become the primary reference for detailed guidance for RCW management on the Forest.

**Direct/indirect effects** - Effects of this alternative would be similar to the Alternative 2. However, Alternative 3 would provide the greater amount of foraging habitat, therefore minimizing the effects of the restoration cuts. Midstory removal would clear the underbrush, vines, and small woody vegetation in the midstory, leaving an open stand well-spaced trees suitable for red-cockaded woodpecker foraging. This is usually done with the use of chainsaws, herbicides, or a combination of both. The installation of insert cavities can be considered a direct beneficial effect in that suitable cavities for red-cockaded woodpecker are created and inhabited quickly.

**Cumulative effects** – Alternative 3 recommends that current forest plan direction be amended to incorporate the *Red-cockaded Woodpecker Recovery Plan, Second Revision*. This alternative amends the plan, and all future projects implemented or planned within the Red-cockaded woodpecker HMA on the Homochitto National Forest, will comply with the direction in the recovery plan. This direction includes the level, distribution, and type of harvests allowed. Fish and Wildlife Service biologists reviewed and concur with the findings of the Biological Evaluations for all projects. In fact, direction, supported by the Fish and Wildlife Service, encourages restoration of longleaf, sufficient regeneration of other pine types to maintain a steady flow of replacement habitats as pines in older stands are lost, and thinning for habitat improvements, pine beetle hazard reduction, and hardwood midstory control.

## Inventories.

The Mississippi Natural Heritage Program database was consulted for Threatened, Endangered and Sensitive species' locations within the project area (Mississippi Natural Heritage Program, 2001). The Mississippi Natural Heritage Program maintains the single most comprehensive data base on the location, numbers, and status of rare and endangered plants, animals, and communities of Mississippi. The District TES database and distribution maps were reviewed to disclose areas of known populations of TES species within the proposed project area. The federally listed red-cockaded woodpecker is surveyed over the ranger district in 10 year sequential surveys of suitable pine and pine-hardwood habitats for new occurrences. In addition, active clusters of red-cockaded woodpeckers are surveyed annually and nest checks done during the nesting season (late April to early June). Breeding bird surveys have been conducted at over 200 permanently established points in 1994, 1995, 1999, 2000 - Present. Numerous fish samples have been taken from various streams across the forest (Ebert, D.J., R.M. Weill, and P.D. Hartfield, 1985; Ebert, D.J. and P.D. Hartfield, 1981; Johnston, C.E. and J.G. McWhirter, 1996; Douglas, N.H., 1975, Warren, M.L., S. Adams, W. Haag, J.G. McWhirter, and L.G. Henderson, 2001).

The Mississippi Natural Heritage Program conducted a rare plant inventory of the Homochitto National Forest (Gordon, K.L. and J.A. Smith, 1992) as well as an overall rare/sensitive plant and animal survey of four proposed lake sites on the Homochitto NF (Gordon, K.L., *et. al.*, 1992). A study of the vascular flora of Amite County was completed by Mac Alford (1999) and reported on sensitive and rare plants collected on and near the Homochitto NF. One study has been completed that is particularly applicable: a study of the effects of red-cockaded woodpecker management on breeding native songbirds (Burger, L.W., Jr., C. Hardy, and J. Bein 1998). Surveys of two stoneflies, once federal candidates for listing, have been conducted on the Homochitto NF (Hardy, C.L., *et. al.*, 1994) (Meriwether and Hargis 2002, unpublished data).

Wildlife Biologist, April Hargis, surveyed selected habitats in the analysis unit June 2006. The area was also surveyed by Forest Ecologist, Ken Gordon. These surveys examined suitable habitats for rare plants and animals which were considered to be possible inhabitants of the project area. The only state record for the locally rare plant *Solidago auriculata* was field verified. Rock outcrops (potential suitable habitat for the Sensitive Webster's salamander) were located and mapped. Road surveys were also done to check for fish passable culverts. Potential risks resulting from management actions were assessed by referring to available occurrence records and to information on the general biology of these species obtained from survey reports, and the scientific literature.

## DETERMINATION OF EFFECTS

### Cumulative Impacts

The planning area is approximately 13,445 acres, of which approximately 97.7% is forested (about 60% pine). Forest Service ownership within the planning area is 41% or approximately 5,548 acres. The majority of the private ownership is held by one large timber company. Approximately 2,745 acres (of the 5,548 acres in USFS ownership in the planning area are

proposed for treatment. Approximately 1,899 acres will receive some type of thinning to improve forest health and hasten the development of the stands as red-cockaded woodpecker habitat. Currently, approximately 53% (2,952 acres) of USFS stands are 60 years old or older and 0.003 % (15 acres) of the stands are equal to or less than 10 years old now. After treatments there will be approximately 45% or 2,511 acres 60 years old or older and 8% of the area will be less than 10 years old. Approximately 396 acres, currently in loblolly pine dominated forest, will be regenerated to longleaf pine with existing longleaf pine retained. Land use patterns on private lands within the analysis unit are predominantly timber production with small amounts of agricultural land and home sites. The vegetation management project described in the EA implements events that are temporary (regenerated lands will be growing trees within 5 years) and mitigated for, these actions should not add to the cumulative effects of private land action.

Effects on water quality are another cumulative effect which could potentially impact aquatic TES species. Water quality modeling developed specifically for the National Forests in Mississippi was applied to this analysis area. The methodology and results of that model are included in the project file for Analysis Unit 23. The estimated disturbance is more than 1000% under the threshold that would be expected to adversely impact or have a cumulative effect on water quality and aquatic habitats.

When compared to past harvesting intensity for this analysis area, on the Homochitto National Forest, the modified proposed action does not represent an increase of harvest activity or road use, and their associated soil and water impacts. Acres of regeneration proposed under the proposed action may be regenerated in the years from 2011 to 2015. Thinning has been an on-going management activity since the 1960's and tends to be very low impact.

The majority of the planned management activities associated with this project would occur in areas that have not been harvested since 1988 to 1992. If no activities are implemented this entry, it could possibly be at least another ten years before this project area is entered again. Forest health already stressed could only be expected to decline until this project area is scheduled for entry again. In addition, the opportunity to return the red-cockaded woodpecker as a breeding bird to the project area would be postponed as well.

Cumulative effects of the adoption of Amendment 19 would be improved stand conditions to deter forest pathogens and management strategies to alter existing stand characteristics and composition into stands with greater suitability to red-cockaded woodpeckers.

Other than the proposed actions described, there are no foreseeable future projects planned on National Forest System land within the project area that may have a negative effect on terrestrial or aquatic plants and animals. The agency knows of no major changes in regards to private land use adjacent to the proposed project area. Activities on private land within these watersheds are expected to remain the same as current for the next 10 years and would not affect the analysis of this BE.



## Threatened and Endangered Species

### Louisiana black bear

In 1992, it was estimated that only 25 to 50 black bears still remained in the state. But by 2010, biologists with the Mississippi Department of Wildlife, Fisheries and Parks estimate that number may have increased to 100 to 120 (<http://www.bbccc.org>) Black bears eat a wide variety of foods, including vegetable matter such as grasses, fruits, seeds, nuts and roots. Insects, fish, carrion, and small rodents are also eaten. Blackberry thickets, hardwood forests producing acorns and other mast and containing shrubs, fallen logs, and brush-piles are typical habitat for black bears. (Mississippi Department of Wildlife, Fisheries and Parks, 1995).

There are no confirmed, resident populations of black bears on the Homochitto National Forest. A pattern of repeated sightings near Sandy Creek (not in the project area) and confirmed bear tracks in Sandy Creek suggest the possible presence of a single black bear wandering on or in the vicinity of the Sandy Creek Wildlife Management Area (Adams county) of the Homochitto National Forest, which is about 5 miles north west of the Analysis Unit 23 project area. There is a confirmed population of at least 3 bears in the general area of southern Wilkinson County. Two of these bears are radio-collared and no sightings of these tagged bears have yet been observed on the Homochitto NF. Recently a radio collared female black bear and five cubs were found in Wilkinson County (2005). A confirmed sighting of a black bear has also been documented in Amite county (2001) approximately 5 miles south of the southern portion of the Homochitto National Forest.

Black bears exist primarily in bottomland hardwood and floodplain forest, although use of upland hardwood, mixed pine/hardwood and coastal Flatwoods and marshes has been documented. However, the tentative red-cockaded woodpecker HMA is not considered prime black bear habitat and sightings in AU23 is unlikely except as a transient, wandering individual. Black bears are adaptable and opportunistic, and can survive in the proximity of humans if afforded areas of retreat that ensure little chance of close contact with humans. Forest management practices, in general, have much less impact on black bear than the density of roads with unrestricted traffic. Black bears could appear in any large block of forest on the Homochitto NF with limited road access but the most likely areas to anticipate new population growth would be in the southwestern quadrant of the forest (Wilkinson and Adams counties).

Direct Effects – Bears could be utilizing areas within the project area, therefore, if a bear was located within the project vicinity during management activities it could be temporarily disturbed, but this disturbance would be short-lived and of minimal effect on any bear present. Black bear are unlikely to occur in the RCW HMA, therefore adoption of Amendment 19 should have no additional effect above current levels.

Indirect Effects -- The proposed vegetation management practices are consistent with the Black Bear Management Handbook (Black Bear Conservation Committee, 1992) recommendations for managing Upland Pine stands. This handbook is referenced in the Louisiana Black Bear Recovery Plan (U.S. Fish and Wildlife Service, 1995) as containing recommendations on management of forests for the Louisiana black bear. Specifically, the handbook called for stand

thinning as soon as economically feasible, tree harvest in "patches" large enough to allow sunlight to penetrate to the forest floor and encourage soft mast production and vigorous growth of herbaceous vegetation, and the maintenance of Streamside Management Zones (SMZ's). After a few years, the "patches" will become impenetrable thickets with many hardwood sprouts and pine seedlings growing vigorously. Bears may still use these sites as denning areas since thick cover will be provided. Also, rotting logs, stumps, and logging slash from the harvest operation will provide a good source of grubs, insects, and beetles. Both thinning and harvest are called for in the action alternatives and both are believed to be consistent with the management recommendations of the handbook. The density of roads in the area will not increase, and traffic will be restricted so should have little to no impact on the bears. Large hollow trees that may be suitable for denning should not be impacted due to location in drainages and stream side management zones.

**Cumulative Effects** – Cumulative effects should be discountable and therefore are not expected to impact this species.

There is no documented observation of black bears in the analysis area, however black bears are known to move large distances and there is a possibility of a transient bear moving through the analysis area and becoming disturbed by the timber harvest activities. Because the proposed actions are the recommended actions to benefit black bear, it is my determination that the action alternatives are "not likely to adversely affect" the Louisiana black bear due to discountable direct and beneficial indirect effects. The no action alternative would have a "no effect" on the Louisiana black bear. Since Black Bear are unlikely to occur in red-cockaded woodpecker habitat, they are unlikely to be effected by the proposed Amendment 19.

### **Red-cockaded woodpeckers**

Red-cockaded woodpeckers (RCW) are native to the open, fire-maintained, pine forests of the southeastern U.S. This species requires large areas of mature, open, pine forests to meet both foraging and nesting requirements. Hardwood midstory negatively impacts the suitability of pine stands for nesting red-cockaded woodpeckers. Management practices that promote the establishment of healthy pine stands are necessary to meet the requirements of Red-cockaded Woodpecker habitat. In general, pine trees 30 years or older are needed for foraging habitat and pine trees 70 years or older are needed for nesting habitat. Trees with red heart fungus that weakens the heartwood are preferred for cavity excavation.

Sawtimber stands previously thinned, treated for midstory reductions, and within the prescribed burning area is potential nesting habitat. In general, the areas proposed for the first thinnings contain tree diameters which are too small for red-cockaded woodpecker cavity construction. However, the areas proposed for first thinning may contain suitable habitat for foraging, although is highly unlikely until they are thinned. Sawtimber stands with a broad range of midstory and understory conditions may also serve as foraging habitat. A foraging analysis was preformed for the analysis area and it was determined that foraging habitat is available for all red-cockaded woodpecker recruitment stands (RCW EIS 1995) and we are improving red-cockaded woodpecker nesting and foraging according to the red-cockaded woodpecker Recovery Plan 2003.

Analysis Unit 23 is completely within the boundaries of the tentative red-cockaded woodpecker habitat management area. There are records of 6 historical red-cockaded woodpecker clusters in the unit, but none have been active since 1988. All sites of pine and pine-hardwood greater than 30 years of age within the project area were surveyed to determine if any new clusters had become established, and no evidence of the establishment of a new cluster was found. There are no currently active clusters within Analysis Unit 23, but it is the intention of the management activities proposed for this unit that suitable habitat for the red-cockaded woodpecker be restored.

The tentative red-cockaded Woodpecker (RCW) habitat management area (HMA) of the Homochitto NF consists of approximately 102,809 acres of potentially suitable habitat targeting the population objective for the active red-cockaded woodpecker clusters. Approximately 54% of the Homochitto NF is designated as tentative red-cockaded woodpecker HMA. There are currently a total of 94 active red-cockaded woodpecker clusters on the Homochitto RD, but none within the project area (See Figure 2).

Yellow pine forests (loblolly and shortleaf pine) dominate about 83% (Table 7) of the total project area and 77% of the suitable foraging acres. The goal of restoring a fire dependent longleaf pine dominated ecosystem is not close to being accomplished within the project area.

**Table 7. Available RCW foraging acreage in project area.**

	Ages Unsuitable for RCW			Ages Suitable for RCW								
Project Area Forest Type	2000-2010 0-10	1990-1999 11-20	1980-1989 21-30	1970-1979 31-40	1960-1969 41-50	1950-1959 51-60	1940-1949 61-70	1930-1939 71-80	1920-1929 81-90	<1920 91+	Total	%
Longleaf									59	305	364	7%
Yellow Pine	0	634	873	844	181	0	23		295	1484	4334	78%
Slash											0	0%
Pine/hwd				131					193	371	695	13%
Total Suitable Forest Types	0	634	873	975	181	0	23	0	547	2160	5393	
% of Total	0.00%	11.76%	16.19%	18.08%	3.36%	0.00%	0.43%	0.00%	10.14%	40.05%	100.00%	
<b>Unsuitable Forest Types</b>												
Hwd/pine									0	47	47	1%
Btmld hwd					23				34	56	113	2%
<b>TOTAL</b>	0	634	873	975	204	0	23	0	581	2263	5553*	100%
%	0%	11%	16%	18%	4%	0%	0%	0%	10%	41%	100%	

\*Approx. 171 acres of Compartment 259 is within AU 21.

An emphasis of the proposed actions is to activate red-cockaded woodpecker recruitment stands 256-14, 256-14, 257-3 and 257-21. These clusters have not been active in over 20 years, but have the most potential to be restored. Clusters in the project area and in the vicinity of the project area are shown in the figure below. The nearest active cluster is over a mile from the project area and over two miles from the nearest cluster within the project area. Establishing the clusters within the project area would create a suitable corridor for red-cockaded woodpecker management.

Proposed Forest Plan Amendment 19 incorporates the second revision of the Red-Cockaded Woodpecker recovery plan, which was signed in January, 2003. The revised recovery plan represents the official policy of the Fish and Wildlife Service as to the actions necessary to recover the population of the woodpecker, which is currently an endangered species. As such, incorporation of the recovery plan into the Forest Plan is expected to produce beneficial effects to red-cockaded woodpeckers. This amendment details a number of changes and clarifications (both minor and major) in existing red-cockaded woodpecker management activities, which are expected to have short and long term benefits to the species. The No-action alternative (Alternative 1), as well as Alternative 2 would maintain the current Forest Plan direction for red-cockaded woodpecker management, and not incorporate the revised direction. It would therefore not represent the best available science for management of the species. Direct, indirect and cumulative benefits would be less than those associated with Alternative 3.

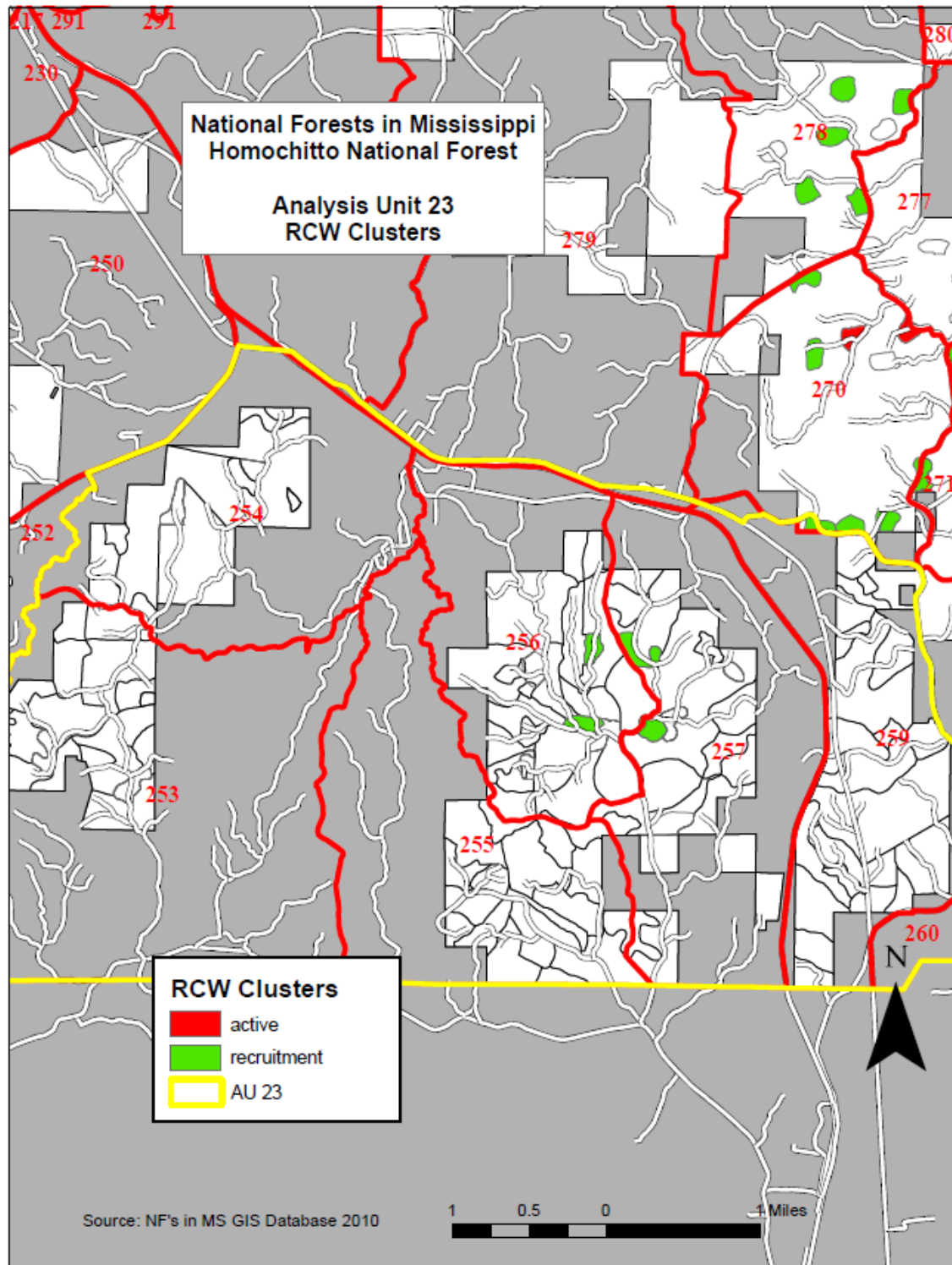


Figure 2. Map showing RCW clusters in the project area and surrounding vicinity.

**Alternative 1 – No Action**

**Direct/indirect effects** – Environmental changes would occur naturally due to biological changes and prescribed fire or weather or insects and diseases. No harvesting would occur to improve the longleaf ecosystem habitat for the present and the future needs of the red-cockaded woodpecker, reducing the chance of providing active clusters within the project area in the long-term. Herbicides would not be applied to eliminate woody understory. Loblolly pine species would continue to dominate the area. Prescribed burning would continue to improve the red-cockaded woodpecker habitat to a limited degree.

The No-action alternative (Alternative 1) would maintain the current Forest Plan direction for red-cockaded woodpecker management, and not incorporate the revised direction. It would therefore not represent the best available science for management of the species. Direct, indirect and cumulative benefits would be less than those associated with Alternative 3.

**Cumulative effects** - This alternative allows all habitats to age without replacement. By not implementing forest health thinning, which can also be used to reduce midstory, potential red-cockaded woodpecker habitat degrades and is at greater risk of insect and disease loss. Without midstory control treatments the understory would likely be dominated by mixed hardwoods with a preponderance of shade tolerant species. Such stands do not support the recovery objectives for red-cockaded woodpecker on the Homochitto National Forest.

**Alternatives 2 and 3**

**Direct/indirect effects** – The treatments proposed in the red-cockaded woodpecker HMA are depicted below by acreage for each alternative.

**Table 8. Alternative treatments proposed within the project area in the designated RCW HMA**

Proposed Activity	No-Action	Alternative 2	Alternative 3
Project Area	5377 acres	5377 acres	5377 acres
Longleaf Restoration cut	0 acres	342 acres	396 acres
Shelterwood Method	0 acres	440 acres	174 acres
Thinning: First Intermediate	1053 acres* 0 acres	407 acres (1460) 1967 acres	560 acres (1613) 1341 acres
RCW Midstory Work	0 acres	118 acres	1332 acres
Planting Longleaf	0 acres	342 acres	396 acres
Release	0 acres	796 acres	570 acres
Pre-commercial Thin	0 acres	796 acres	570 acres
RCW cavity inserts	0 Inserts	84 Inserts	84 inserts
0-10 age class	14 acres; .25%	782 acres; 14%	441 acres; 8%

\* Acres from 1<sup>st</sup> thin EA, these acres would be thinned under all alternatives

Both action alternatives (Table 8) would be beneficial to the red-cockaded woodpecker and its habitat, at different levels and periods in time. Longleaf pine restoration would provide future red-cockaded woodpecker habitat by removing older loblolly pines and planting longleaf pine. This would help establish the longleaf pine component in the area. Alternative 3 would provide the greater amount of foraging habitat, therefore minimizing the effects of the restoration cuts. This increase is only possible with adoption of Amendment 19. Regeneration would provide age-class diversity of stands and help sustain habitat over time. Two-aged management using the shelterwood method, where residual trees are retained and never harvested, provide foraging for the red-cockaded woodpecker and help reduce habitat fragmentation. Midstory removal would clear the underbrush, vines, and small woody vegetation in the midstory, leaving an open stand well-spaced trees suitable for red-cockaded woodpecker foraging. This is usually done with the use of chainsaws, herbicides, or a combination of both.

The proposed thinning would aim to remove yellow pine species from longleaf pine stands and emphasize longleaf pine retention in predominantly yellow pine stands, working toward the desired longleaf pine ecosystem. Thinning in all action alternatives would open the canopy, reduce midstory, and stimulate herbaceous community development, which also improves the red-cockaded woodpecker habitat to meet more of the desired conditions.

In conjunction with burning, release and pre-commercial thinning in the young pine stands would improve understory conditions that would grow the desired native grass forb understory and promote diversity and the growth of the desired longleaf canopy. The installation of insert cavities can be considered a direct beneficial effect in that suitable cavities for red-cockaded woodpecker are created and inhabited quickly. Herbicide applications should have little to no impact to the red-cockaded woodpecker. The low toxicities of the proposed formulations would not be expected to harm red-cockaded woodpeckers or any wildlife. Bird toxicities are: Imazapry – bobwhite quail  $LD_{50} > 5,000$  mg/kg; Triclopyr  $LD_{50} = 849$  to  $2,055$  mg/kg; Hexazinone – bobwhite quail  $LD_{50} = 2,258$  mg/kg; Sulfometuron Methyl – mallard ducks  $LD_{50} > 5,000$  mg a.i/kg.

There are no active red-cockaded woodpecker clusters in Analysis Unit 23. There are 4 recruitment stands, an area to be managed for the possible future inhabitation by red-cockaded woodpeckers, located within the Analysis Unit and 2 inactive. Red-cockaded woodpeckers have not occupied any clusters in this unit since at least 1988. The opportunity exists to enhance the population expansion of the red-cockaded woodpecker with habitat improvement work such as hardwood midstory removal, thinning of dense pine stands, placement of artificial inserts for nesting (replacing old inserts and increasing recruitment stands) and regeneration of longleaf dominated forests to ensure the long term survival of these clusters. Analysis Unit 23 lies within the boundary of the tentative red-cockaded woodpecker habitat management area for the Homochitto National Forest. The proposal as developed contains all of these elements in the plan, and habitat enhancement for the red-cockaded woodpecker is one of the major driving forces in developing the management proposal for this Analysis Unit. Habitat for red-cockaded woodpecker will move toward conditions recommended in the Red cockaded Woodpecker (Picoides borealis) Recovery Plan (Second Revision 2003) by reducing hardwood midstory and thinning.

The majority of the project area is currently dominated by stands with dense pine and hardwood canopies. This condition is inhibiting red-cockaded woodpecker population expansion into the area. There is a need to produce additional nesting habitat through the use of artificial nest inserts. Typical red-cockaded woodpecker habitat possess a more open canopy with an understory of grasses, small shrubs and some scattered small hardwoods. This type of understory composition is typically maintained by prescribed fire.

According to records for the Homochitto National Forest, there were 42 active red-cockaded woodpecker clusters in 1987. By 1992, the number of active red-cockaded woodpecker clusters had dropped to 22. In 1990, the Homochitto National Forest began to actively thin pine, implement hardwood midstory reduction, prescribe burn, and install artificial nesting inserts for red-cockaded woodpecker habitat enhancement. These efforts were largely focused in and adjacent to active red-cockaded woodpecker clusters. Through these combined efforts, the current red-cockaded woodpecker population for the Homochitto National Forest has now reached 94 active clusters (reporting year 2010).

The analysis area was surveyed in 2005 for the red-cockaded woodpecker (RCW). No red-cockaded woodpecker presence was noted. Although suitable habitat for red-cockaded woodpecker exists within this analysis unit habitat conditions, will improve by increasing herbaceous ground cover, opening dense stands and by promoting longleaf restoration. The herbaceous ground cover is lacking in many areas due to the dense hardwood midstory, which blocks sunlight from reaching the forest floor.

**Direct Effects** – Because all management activities proposed are intended to benefit the red-cockaded woodpecker, and because management activities will take place outside of nesting and fledging season, there should be no negative direct effects on this species. There are no known active clusters in the analysis unit.

**Indirect Effects** -- The proposed project should enhance red-cockaded woodpecker habitat by reducing hardwood midstory and pine basal area by prescribe burning and thinning, replanting longleaf in historic longleaf areas, which will encourage the grass-forb understory typical of red-cockaded woodpecker habitat. Therefore there should be long-term beneficial indirect effects on the red-cockaded woodpecker.

**Cumulative Effects** -- Cumulative effects should be discountable and therefore are not expected to impact this species.

The Alternative 3 will best meet the long-term needs of the red-cockaded woodpecker by adopting the best available science, removing hardwood midstory, lessening the possibility for southern pine-beetle infestation, and by providing for future habitat needs by removing loblolly pine and replacing it with longer-lived and pine-beetle resistant longleaf pine. The No Action Alternative does not provide for any of these long-term needs. Based on this and the beneficial impacts to red-cockaded woodpecker habitat within the project area, it is my determination that the Alternative 3 will have a “not likely to adversely effect” determination for the red-cockaded woodpecker due to the beneficial work being proposed. The no action alternative would have a



“not likely to adversely effect” the red-cockaded woodpecker in the long term due to negative indirect effects of not managing toward suitable red-cockaded woodpecker habitat. Alternative 2 does not maximize the foraging recommendations but would still have a “not likely to adversely effect” determination.

### **FS Sensitive Species**

**Webster's salamanders** are strongly associated with moist, north-facing, mixed-hardwood slopes with rock outcrops on or near the surface (Wilson 1995). Distribution across their range is very disjunct and they have not been documented on the Homochitto National Forest. A reptile and amphibian survey of four potential lake impoundment sites on the Homochitto Ranger District was conducted for 29 field days (between 21 April and 18 November 1992). Utilizing past field experience with this species the surveyor searched under logs and leaf litter above streams in hilly terrain and found no specimens. The surveyor concluded that while Webster's salamander occurs in southwest Mississippi in a disjunct range pattern, its occurrence on the Homochitto Ranger District might be expected (Vandeventer, T.L., 1992). On February 3, 1998, two potentially suitable sites in Compartment 43 (about 25 miles north east of the analysis area but containing rock outcrops and therefore presumably more suitable habitat) were surveyed for Webster's salamanders, but none were located. Analysis Unit 27 (in Wilkinson County, approximately 5 miles west of Analysis Unit 23) was surveyed on March 17, 2005 and no salamanders were found. Rock outcrops were found in Analysis Unit 23 so it is likely that suitable habitat exists in this area, and it is possible the salamanders could be present.

Adoption of Amendment 19 has the potential of modifying Webster's salamander habitat inside the tentative RCW HMA in a negative way by creating a more xeric, fire maintained habitat. This change would take place over many years and the impact will be mitigated if prescribed burns are allowed to naturally burn out at the edge of riparian areas. Accumulation of hardwood litter within the HMA would be expected to decline with adoption of Amendment 19 because of thinning of the stands and removal of the hardwood midstory. If populations of this salamander are located within the HMA, direct effects on individual populations could be avoided by project review before specific activities take place.

**Direct Effects** – There are no known occurrences of Webster's salamander on the Homochitto Ranger District. Due to the apparent absence of the salamander on the district, there should be no direct effects on the Webster's salamander. However, if the salamander were found to be present there could be potential impacts to the salamander during harvesting activities. These impacts would be minimal because this species is normally above ground for only a few months during the winter and then underground for the remainder. Harvesting activities typically take place during the dry summer months, when the salamander is below ground. Prescribe burning may have minimal impacts, however, fire generally does not burn on the north facing slopes during the winter time when the salamander, if present, would be above ground and active.

**Indirect Effects** – If salamander habitat is present within the analysis area, habitat could be disturbed during harvesting activities. However, areas with rock outcrops generally would be avoided, due to the steep slopes and rocky terrain, therefore potential negative indirect impacts should be minimal.

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

Both action alternatives proposed “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability”. However, the impacts should be minimal due to there being no known occurrences on the District and harvesting activities occurring when the salamander is underground and inactive. The no action alternatives will have “no impact” on this species.

### **Bald eagle**

Bald eagles are generally limited to winter occupancy in Mississippi. The bald eagle is a large bird that generally occurs in the vicinity of lakes, rivers, and marshes and along seacoasts. Nesting usually occurs in areas with mature trees near large bodies of water. The diet of southeastern bald eagles is primarily fish, supplemented with reptiles, waterfowl, small mammals, and carrion. (Mississippi Department of Wildlife, Fisheries and Parks, 1995). Although bald eagles winter and breed on St. Catherine’s Creek National Wildlife Refuge (approximately 25 miles to the West of this Analysis Unit) and a pair is now nesting on Okhissa Lake (Homochitto Ranger District), no suitable habitat is known to occur in the project area, and this area is considered generally unsuitable habitat for the bald eagle.

Because the tentative RCW HMA is not considered to contain habitat for the bald eagle, adoption of Amendment 19 should have no direct, indirect or cumulative effect on the bald eagle.

Direct Effects – Since no bald eagles or their nests have been observed in the project area, no direct effects on this species are expected.

Indirect Effects – Suitable nesting and feeding activity has not been documented in the project vicinity. Consequently, the proposed activity should have no indirect effects on bald eagles.

Cumulative Effects – Cumulative effects should be discountable and therefore are not expected to impact this species.

Based on the lack of suitable habitat in the project area, it is my determination that all alternatives will have “no impact” on the bald eagle.

**Bachman's sparrow** is a habitat specialist. Historically, it was found in mature to old growth southern pine woodland subject to frequent growing-season fires. It is a fugitive species, breeding wherever fires create suitable conditions. It requires a well-developed grass and herb layer with limited shrub and hardwood midstory. Ideal habitat was originally the extensive longleaf pine woodlands of the South. In the southeastern U.S. on the Coastal Plain breeding habitat usually is open pinewoods with thick cover of grasses or saw palmetto. Bachman’s sparrow is able to colonize recent clearcuts and early seral stages of old field succession, but such habitat remains suitable only for a short time. These habitat conditions are nearly

synonymous to the habitat associated with red-cockaded woodpecker restoration. On the Homochitto National Forest, Bachman's sparrow populations have been observed in active red-cockaded woodpecker clusters and adjacent suitable red-cockaded woodpecker habitat where thinning of the hardwood component and regular prescribed fire has taken place. Within the analysis area, there are approximately 3,153 acres of mixed pine that will be burned on an average three year cycle. This type of habitat is preferred by Bachman's sparrows. The remaining pine and pine/hardwood forest that is not subject to regular prescribed fire is not suitable for the Bachman's sparrow. Continued management in open pine stands for red-cockaded woodpeckers and improvement of more dense stands by midstory removal techniques and aggressive prescribed fire regimes will provide beneficial habitat for the Bachman's sparrow.

Because the habitat requirements for Bachman's sparrow are very similar to those of the red-cockaded woodpecker, approval of Plan Amendment 19 to enhance red-cockaded woodpecker habitat would have similar benefits for this sparrow.

Direct Effects – There is a chance that a Bachman's sparrow nest could be damaged or destroyed during harvest activities, however the effect would be short term (the loss of a single years reproduction at worst).

Indirect Effects – Within the approximately 3,153 acres of fire-maintained habitat within the analysis unit, the proposed thinning and restoration of longleaf pine through regeneration will enhance or create habitat for the Bachman's sparrow. Potential impacts to Bachman's sparrow include the following: Under the no action alternative, deferment of thinning, midstory removal and prescribed burning will result in lost opportunities for development of habitat for the Bachman's sparrow. Because they include thinning, midstory removal and prescribed burning to open the forest stand and promote a grassy/brushy understory, all action alternatives will result in additional suitable habitat for the Bachman's sparrow. Regeneration will result in short term losses of potentially suitable habitat.

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

The action alternatives should create and maintain additional acres of suitable habitat. The no action alternative does not cause any direct adverse impacts on the Bachman's sparrow population in the short term, but it does not create and maintain new habitat for the long term, therefore there would be a “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability”. The action alternatives “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species due to the long term beneficial impacts. Alternative 3 being more beneficial in the long term than Alternative 2 due to increased amounts of longleaf pine restoration (made possible by the adoption of Plan Amendment 19).

The **Pearl blackwater crayfish** inhabits permanent —or nearly so—streams with clear sandy bottoms. The species occupies a limited range which is confined to drainages associated with the west bank of the Pearl River and streams associated with the north shore of Lake Ponchatrain. Recent records from the Homochitto National Forest in Amite and Franklin Counties are the first records from the Homochitto River drainage (J.F. Fitzpatrick, in press). The Homochitto National Forest collections were made from water under exposed tree roots in streambanks in Tanyard Creek, Richardson Creek, Porter Creek, and Dry Creek (in the McGehee Creek drainage). (Tom Mann, Pers. Comm. 2000). An additional collection from Brushy Creek was made in 1980 (Collections Records, Mississippi Museum of Natural Science). Collection records confirm the presence of the Pearl blackwater crayfish within the Homochitto NF and it is likely that other undocumented occurrences occur within the project area. Because the crayfish live in flowing streams, their presence within the planning area would be restricted to flowing streams. Logging equipment is allowed only to cross streams at 90 degree angles and only at designated crossings. Heavy equipment is also restricted within the streamside management zones (only 10% soil disturbance allowed within these areas). Therefore, impacts to the crayfish should be low.

Direct Effects – Equipment should not cross any flowing streams, therefore there should be no negative direct effects to this species.

Indirect Effects – The no action alternative is anticipated to result in no change of habitat suitability for the pearl blackwater crayfish. Suitable habitat for pearl blackwater crayfish may be deteriorated or lost if timber harvesting results in the removal of overstory streamside canopy, additional stream siltation, and destabilization of stream banks (T. Mann, Pers. Comm. 1993). Potential impacts to the pearl blackwater crayfish will be minimized through implementation of streamside management zones, which provide for protection of the overstory streamside canopy and reduction of potential siltation and destabilization of stream banks. Because this is an aquatic species, adoption of Amendment 19 will have no direct, indirect or cumulative impacts on the Pearl blackwater crayfish.

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

The action alternatives “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species, however these impacts should be discountable and insignificant. The no action alternative will have “no impact” on this species.

The **Alabama shad** is an anadromous species that spawns in large flowing rivers from the Mississippi River to the Suwannee River of Florida (Office of Protected Resources, 2001). The largest existing population occurs in the Apalachicola River of Florida (Office of Protected Resources, 2001). Other notable populations persist in the Pascagoula River drainage of Mississippi and the Mobile River drainage of Alabama. The fish enter freshwater during the spawning season (January to April) when water temperature reaches 19 to 22 degrees Celsius. Spawning is known to occur over sand, gravel, and rock substrates in a moderate current (Office of Protected Resources, 2001).

The decline of the Alabama shad in Alabama has been blamed on the construction of a series of high lift navigating dams in the Alabama and Tombigbee Rivers, which block spawning migration (Office of Protected Resources, 2001). Other threats to the shad include poor water quality and commercial and navigational dredging of sand and gravel from river bars used for spawning (Office of Protected Resources, 2001).

Currently the closest known population of Alabama shad was collected from the Amite River in Amite County, Mississippi (Mississippi Museum of Natural Science, Pers. Comm. 8/13/01). It is possible, but highly unlikely, for the Alabama shad to be in the Homochitto River drainage (Mississippi Museum of Natural Science, and Southern Research Station, Pers. Comm. 8/13/01). If the shad were utilizing the Homochitto River, it would be restricted to the main stem. Because projected activities are restricted to the RCW HMA, approval of Amendment 19 will have no direct, indirect or cumulative impact on this species.

Direct Effects – Because the action alternatives are not within the Amite River drainage, no direct effect on the Alabama shad will be possible.

Indirect Effects -- Because the action alternatives are not within the Amite River drainage and well away from the main stem of the Homochitto River, no indirect effect on the habitat of the Alabama shad should be possible.

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

Because the action alternatives are well away from both the Amite and Homochitto Rivers (main stems), there will be “no impact” on the Alabama shad. The no action alternative will have a “no impact” determination as well.

The **crystal darter** is known from the Pascagoula, Pearl, and Tombigbee drainages in the Gulf of Mexico basin and from the Bayou Pierre and Homochitto River systems in the Lower Mississippi drainage. It is represented in the Homochitto River drainage by a single collection in 1973 at the Highway 98 Bridge south of Bude (Ross, Stephen T. Pers. Comm.). Since that time, no other collections of this species have been made from the Homochitto drainage despite surveys relevant to the project area. Crystal darters inhabit clean sand and gravel beds with swiftly flowing water in large rivers. The streams in this project area are too small to be inhabited by this species and therefore are not classified as suitable habitat for this species. Because possible habitat for this species is outside of the tentative RCW HMA, adoption of Amendment 19 will have no direct, indirect, or cumulative impacts on the crystal darter.

Direct Effects – Because the location of the project area is outside of potential habitat it is expected that there will be no negative direct effects.

Indirect Effects – Because habitat will not be impacted by the action alternatives, indirect effects are not expected.

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

Therefore all alternatives will have “no impact” on populations of this species.

The **broadstripe topminnow** is found only in the Lake Pontchartrain Drainage and in the Amite and Tangipahoa River systems. Dr. Stephen Ross, fisheries biologist at the University of Southern Mississippi, confirmed that broadstripe topminnows are not considered potential residents of the Homochitto River drainage. Based on this, the analysis area does not contain suitable habitat for this species. Adoption of Amendment 19 will have no direct, indirect, or cumulative impact on this species.

Direct Effects – None

Indirect Effects -- None

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

Therefore all alternatives will have “no impact” on populations of this species.

Nymphs and adults of both the **Natchez and chukcho stoneflies** are associated with small, clear, cold, and unpolluted streams. These streams are usually 1-4 meters in width, with full overstory canopy and sandy gravel substrate (Hartfield 1993). They are weak fliers and will usually remain near the water from which they emerge as nymphs. Present surveys seem supportive of Brown and Stark's (1995) suggestion that both species are endemic to southwest Mississippi. Surveys for Natchez and chukcho stoneflies have been conducted in streams of the Homochitto Ranger District. Sixty-six stream sites in the Homochitto National Forest were sampled for adult stoneflies. Natchez stoneflies were found at 23 sites and the Chukcho found at 9 sites. During the spring of 2002, selected streams in Analysis Units 16 and 17 were sampled for these stoneflies using both black light traps and sweep nets. These surveys were conducted between April 15 and April 19 and involved 8 sample sites in Analysis Unit 17 and 3 in Analysis Unit 16. Analysis Unit 17 had recent (FY2000) timber sale activity and Analysis Unit 16 had no recent timber sale activity. One station (157) in Analysis Unit 17 had neither Natchez nor chukcho stoneflies collected. One station in Analysis Unit 16 (153B) and two in Analysis Unit 17 (107L & 155A) had only Natchez stoneflies collected. These four stations were in the upper ends of their respective watersheds and were not considered representative stonefly habitat. Seven stations (2 in Analysis Unit 16 and 5 in analysis Unit 17) had both species collected.

One site was sampled in Analysis Unit 23. Neither stonefly was found. However, the analysis unit may contain other, unsampled drainages with potential suitable habitat for these stoneflies. Because no impact on stream quality or abundance is expected, adoption of Amendment 19 will have no direct, indirect, or cumulative impacts on these species.

Direct Effects – Equipment will not cross flowing streams, therefore there should be no negative direct effects to the stoneflies.

Indirect Effects – There could be negative indirect effects to the stoneflies with this project, however, impacts should be minimal. Soil disturbance is limited to 10% within the filter strip along the stream, therefore, there could be additional sediment entering the water. This, however, should be temporary and therefore indirect effects would be short term.

Cumulative Effects -- The cumulative effects should be discountable and therefore are not expected to impact this species.

Possible short term impacts from all action alternatives, “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the stoneflies. The no action alternative will have a “no impact” determination.

Although the range of the **rayed creekshell** (*Anodontoidea radiatus*) covers portions of five southeastern states (Alabama, Florida, Georgia, Louisiana, and Mississippi) its occurrence is sporadic. Museum records suggest that historically it was seldom collected in large numbers, and today it is unusual to find more than a few individuals at a site. Now this mussel is considered to be of special concern due to reductions in both the number of sites where it historically occurred as well as a decline in the number of individuals found per occurrence (NatureServe Explorer, 2002). Threats to this species include sedimentation as a result of bank destabilization, runoff from agriculture and roads and overall stream modifications. This species is known from large rivers, however, most collections are from small to medium-sized creeks where it occurs in mud, sand, or gravel substrates in slow to medium currents (NatureServe Explorer, 2002). The immature form is parasitic, however species of host fishes are not known.

This species of mussel has not been found on the Homochitto National Forest and it is not known from the Homochitto River, into which most drainages on the Homochitto National Forest flow. However, this species is known to occur in the Amite River watershed, which does include a very small portion of the Homochitto National Forest. This creek, that is part of the Amite Watershed, is not within the project area; therefore, there should be no impacts to the rayed creekshell. Because no impact on stream quality or abundance is expected, adoption of Amendment 19 will have no direct, indirect, or cumulative impacts on this species.

Direct Effects – No direct effects are expected due to the location of this drainage, which is not within the Amite River Watershed and well away from any proposed activities.

Indirect Effects – No indirect effects are expected. Again, this is due to the location of the proposed project being outside of the Amite River watershed.

Cumulative Effects – Cumulative effects should be discountable and therefore are not expected to affect this species habitat.

Therefore all alternatives will have “no impact” on populations of this species.

While **Rafinesque's big-eared bats** may use a variety of habitats for foraging, their distribution is most likely tied to suitable roosting habitat such as abandoned buildings, abandoned mines and wells, beneath concrete road bridges, trees with loose bark, and trees with cavities extending upward from the opening. In general, the high densities of insects that can be found around bodies of water such as streams and ponds makes these very important foraging habitat for this bat species.

In 1991, a colony of Rafinesque's big-eared bats was observed roosting in an abandoned house on a small private inholding of land within the Homochitto National Forest (J.A. Smith, Pers. Comm., 1992b). Because current inventory methods for the Rafinesque's big-eared bat are neither feasible nor effective for determining definitive information on the number and location of individuals, and because the project and all alternatives are expected to have minimal effects, site-specific inventory was not performed. It was assumed that Rafinesque's big-eared bats were or could be present in the study area and the effects of management on the species were analyzed. Implementation of Amendment 19 (Alternative 3) should have minimal direct, indirect or cumulative effects on this species since hardwoods displaced in the upland pine areas in the tentative HMA would be offset by the retention of hardwoods in riparian areas as well as clumps of hardwoods retained in the reserves group.

**Direct Effects** – Bats could be living in trees of the type proposed for harvest, therefore, there could be potential minimal negative direct effects to the bat. However, this bat is more likely to utilize trees that form cavities which would unlikely be harvested in this project due to locations within riparian areas.

**Indirect Effects** - Standard mitigations require the leaving of snags and cavity trees for wildlife purposes. The presence of these snags is further enhanced by the leaving of additional hardwoods and pines in groups of 2-5 trees or in clumps of trees from 0.5 to 2 acres in size within the regeneration cuts. In addition, the largest trees with loose shaggy bark and or cavities are in the creek bottoms and should be maintained inside the streamside management zones. Therefore, the project should have only minimal indirect effects on the Rafinesque's big-eared bat. Small vernal ponds will be constructed with the proposed actions, which would indirectly benefit this species by providing areas in which to feed. Both action alternatives should have no impacts on bridges, or large hollow trees in the riparian areas. Hollow trees within RCW management areas could be reduced by the thinning of stands, and reduction of hardwood species. Such impacts would be expected to be minor, and not contribute to a loss of viability or a federal listing of threatened or endangered.

**Cumulative Effects** - The cumulative effects are discountable and therefore are not expected to impact this species.

The No-action alternative (Alternative 1) as well as Alternative 2 would maintain the current Forest Plan direction for red-cockaded woodpecker management, and not incorporate the revised direction. It would therefore not represent the best available science for management of the species. The No Action Alternative will have “no impact” on populations of the species, however, with this alternative no ephemeral ponds will be constructed so additional feeding



habitat will not be provided. With both action alternatives, streamside management zones will continue to provide large trees capable of producing cavities of the sort needed as potential roost sites, bat houses and vernal ponds will be constructed. Because of these factors and the relatively small percentage of the forest area being harvested, it is determined that the action alternatives “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species due to the small percentage of habitat disrupted.

**Southeastern Myotis** is a small insectivorous bat with short, thick, woolly fur. As its name implies, it lives in the southeastern United States, from coastal North Carolina south into peninsular Florida, west through Louisiana and into eastern Texas and southeastern Arkansas. It also lives along the lower Ohio River Valley in Kentucky, Indiana, and Illinois (natureserve.org, Texas Parks & Wildlife [http://www.tpwd.state.tx.us/nature/wildl/mammals/bats/species/se\\_myotis.htm](http://www.tpwd.state.tx.us/nature/wildl/mammals/bats/species/se_myotis.htm)).

A large portion of the Southeastern Myotis population apparently occurs in northern Florida in caves. Outside of this region, maternity colonies tend to be smaller and located in hollow trees and other noncave sites. Florida still has large numbers, but a 45-50% decline occurred over the past 30-40 years (with no sign of abatement) in both numbers of bats and number of major maternity roosts. Although population estimates are of uncertain accuracy; small numbers of known large maternity colonies results in high vulnerability to devastation by large scale disasters such as a regional flood event affecting many caves simultaneously. Better information is needed on trend and on abundance outside of Florida (natureserve.org).

Large numbers of *S. myotis* congregate and form maternity colonies in caves in Florida and have been reported a few times in buildings. Maternity colonies are also known from one cave in Georgia and one in Alabama. In the rest of the deep south, where there are limited caves, these bats use buildings and other structures, mines, and hollow trees for spring and summer roosts. By winter in this region they roost in small groups in outdoor sites, often over water, such as bridges, culverts, storm sewers, and boat houses, as well as in hollow trees (Barbour and Davis 1969, Humphrey and Gore 1992, natureserve.org 2004).

The key characteristics for maternity sites are high humidity and constant warm temperatures. Foraging habitat is riparian floodplain forests or wooded wetlands with permanent open water nearby (MacGregor 1992, Gardner et al. 1992, Humphrey and Gore 1992).

Management requirements include maintaining high quality forested wetlands with component of large hollow trees near permanent water. It is unknown at this time the importance of hollow trees and other non-cave sites as maternity roosts. Threats include improper cave gating or entrance closure, disturbance by humans, flooding and clearcutting around a cave may cause local declines (Gore and Hovis 1992). This species is also threatened by habitat loss. In many areas suitable habitat is being cleared for housing and bottomland hardwood harvested. This species does not tolerate disturbance at roosting sites in the summer (Humphrey and Gore 1992) or winter (natureserve.org 2004). The adoption of Amendment 19 (Alternative 3) should have minimal to no impact on this species since management actions in the tentative HMA to benefit the red-cockaded woodpecker would be in the upland pine habitat, not in the riparian habitats preferred by this species.

Direct Effects - Because suitable habitat such as large hollow trees near a permanent water source should not be impacted due to the streamside management zones there should be no direct effect on the Southeastern myotis.

Indirect Effects – Both action alternatives should have no impacts on bridges, or large hollow trees in the riparian areas. Hollow trees within RCW management areas could be reduced by the thinning of stands, and reduction of hardwood species. Such impacts would be expected to be minor, and not contribute to a loss of viability or a federal listing of threatened or endangered.

Cumulative Effects -- The cumulative effects are discountable, therefore not expected to impact this species.

Because the action alternatives will not effect habitat suitable to this species, there will be “no impact” on the Southeastern myotis. The No Action Alternative will have “no impact” on populations of the species.

The **Arogos skipper** is a small butterfly with a wingspan about 1 to 1 ¼ inches. This species is found only in native grasslands, including prairies, savannahs, and bogs. The butterfly is rare and local in distribution. The larval foodplant is Bluestem grasses in the mid west and northern New Jersey, lopsided indiangrass in Florida, toothache grass along the Gulf Coast, and pine barrens reedgrass in the Carolinas and southern New Jersey. The adults feed on nectar from flowers such as blazing star, purple vetch, dogbane, stiff Coreopsis, purple coneflower, green milkweed, and ox-eye daisy among others.

There has been a recent concern about the survival of this species and a status survey has been commissioned by the U.S. Fish and Wildlife Survey to determine if listing as an endangered species is appropriate. In the vicinity of the Homochitto, historical collections exist for both Hinds and Copiah counties. Over seven person-days (mid August through mid September) were spent collecting skippers in seemingly suitable habitat on the Homochitto Ranger District in grassy portions of nineteen sections scattered throughout the forest. None of the specimens collected were the Arogos skipper (Marc Minno, Pers. Comm., 2001).

Direct Effects – The greatest threat to the survival of the Arogos skipper, if indeed it is part of the District’s fauna, is the burning of large contiguous blocks of grassland for which no refugia are retained, not timber harvest (Minno, M., Pers. Comm, 2001). However, during logging activities, there is a potential for the larvae, which feeds on the bluestem grasses to become impacted. Therefore, there could be minimal direct effects on the Arogos skipper as a result of this proposed project.

Indirect Effects – Because the creation of open, fire maintained grass-forb habitat of the type being created on that portion of the project area within the burn block is considered suitable for the Arogos skipper, suitable habitat may be created. Adoption of Amendment 19 would be expected to accelerate this creation.

Cumulative Effects -- The cumulative effects are discountable and therefore are not expected to impact this species.

Because the Arogos skipper is not confirmed to occur on the Homochitto Ranger District, and because the management proposed is anticipated to create habitat beneficial to the skipper, the action alternatives “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” on the Arogos skipper population due to the discountable short term impacts, but long term beneficial impacts. The no action alternative would have “no impact” on this species in the short term.

***Trachyxiphium heteroicum*** (a moss) is a slender, green, flaccid, rather shiny moss growing in mats with an interesting, if confusing, distribution. This small moss was for many years considered to be endemic to wet forests on soil and logs at moderate elevations (up to 5500 feet) in the Puebla and Veracruz states of Mexico. It was not known to occur outside of Mexico until August, 1969 when it was collected growing on a wet, rotted log in a spring seep at Clear Springs Recreation Area, Homochitto National Forest. Between 1969 and 2000, it had been collected only two other times in the United States: both from Washington Parish, Louisiana. All currently known collections from the southern United States come from man-made habitats: an artificial lake in Mississippi; and concrete culverts around springs in Louisiana (Crum and Anderson, 1981). In September 2000, a concentrated effort was undertaken to confirm this species continued occurrence on the Homochitto. The original collector was contacted in order to develop a refined search image. Dr. Reese provided valuable information on the specific microhabitat required by this species and a better verbal description of the site of the first collection. It was re-collected from the original location in September 2000. Its current status on the Homochitto is being investigated. Although at least six other spring seeps seemingly suitable have been investigated, the moss has been collected only one other time on the Homochitto. Based on research to date, it seems that this moss is associated with decaying wood in springs and spring seeps. The specific type of seep seems to be of a type that has water flowing year-round. Current flow is obvious and mosses dominate the lowest level of the ground cover, although there are patches of bare sand and gravel present. Since this species occurs in habitats requiring permanently flowing spring water, adoption of Amendment 19 will have no direct, indirect, or cumulative impacts on this species.

Direct Effects – There are no known occurrences of *Trachyxiphium heteroicum* in the vicinity of the project. All potential habitats should not be impacted within the streamside management zones and with standard wetland mitigation measures.

Indirect Effects – Because spring seeps and other wetland types are specifically avoided, there should be no indirect effects on *Trachyxiphium heteroicum*.

Cumulative Effects -- The cumulative effects are discountable and therefore are not expected to impact this species.

The action alternatives focus management activities on ridges and specifically avoid streamside management zones and all wetlands and known locations are given optimal protection. Therefore, all alternatives will have “no impact” on the discussed species.

The **cypress-knee sedge** is an aquatic sedge that is usually associated with cypress trees, logs, or knees. It occurs in areas of permanently flooded cypress timber. Frequently the cypress-knee sedge may occur on floating or partially submerged rotting logs or stumps and may form dense tussocks. It has been found in all light conditions from full sun to dense canopy. Associated species may include: baldcypress (*Taxodium distichum*), swamp black gum (*Nyssa biflora*), red maple (*Acer rubrum*), possum haw (*Viburnum nudum*), buttonbush (*Cephalanthus occidentalis*), bogmoss (*Mayaca fluviatilis*), marsh St.-John's-wort (*Triadenum walteri*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis* ssp, *spectabilis*), and netted chain-fern (*Woodwardia areolata*). The present distribution of cypress-knee sedge is poorly understood partially because of the inaccessible nature of the habitat and the generally inhospitable nature of southern swamps in mid-summer (snakes and mosquitoes) (Bryson, Charles. 2001. pers comm.). The cypress-knee sedge has been collected from at least four sites on the Homochitto RD and with additional surveys new sites will undoubtedly be added. Because this plant occurs in wetlands, it is unlikely that the adoption of Amendment 19 could have any direct, indirect or cumulative impacts on this species. Direct effects on individual plants should be avoided by project review before specific clearing and burning activities take place.

Direct Effects – Because neither the species nor suitable habitat will be included in areas to be managed, no negative direct impacts to the cypress-knee sedge is likely. All known locations are protected from management activities.

Indirect Effects -- Direct Effects – Because neither the species nor suitable habitat will be included in areas to be managed, no indirect impacts to the cypress-knee sedge is likely.

Cumulative Effects -- Known occurrences of this species have been given optimal protection and suitable habitats generally remain undisturbed. Therefore, cumulative effects should be discountable and are not expected to impact this species.

The action alternatives focus management activities on ridges and just minimally within the streamside management zones and none within wetlands. There are no cypress sloughs in the analysis area. Therefore, all of the alternatives will have “no impact” on the discussed species.

The **Small's wood fern** (*Dryopteris x australis*) occurs in moist to wet woodlands (shaded seeps and bald cypress swamps) comprised of several species of deciduous hardwoods and sweetbay, sometimes with baldcypress and dwarf palm. Associates include: sweetgum, swamp black gum, tulip poplar, loblolly pine, cinnamon fern, royal fern, lizard's tail, poison sumac, American holly, red maple, switchcane, and netted chain fern. This species is known to occur on the Homochitto Ranger District but not in the planning unit and an extensive survey to locate additional populations in seemingly suitable habitat on the forest has been conducted without additional populations being located (J.A. Smith, 1995). No populations of this species were located during

site surveys in 1998 and 2001. No management activities are planned for areas of seemingly suitable habitat. All known locations of this species are protected. Since the known population is outside of the tentative RCW HMA, adoption of Amendment 19 would have no impact on this species.

Direct Effects – Because no management activities will take place within seemingly suitable habitat and because no individual plants were found during field surveys, no direct effects are expected.

Indirect Effects – Because suitable potential habitat is being protected, no indirect impact on the species is expected.

Cumulative Effects -- Known occurrences of this species have been given optimal protection and suitable habitats generally remain undisturbed. Therefore, cumulative effects should be discountable and are not expected to impact this species.

All alternatives should have “no impact” for the discussed species.

The **bay starvine** (*Schisandra glabra*) may be locally abundant on steep slopes beneath deciduous hardwoods (beech-magnolia) and occasional pines, usually midslope or lower, and less commonly found on floodplains along the bases of mixed hardwood slopes. Associates: American beech, spruce pine, shortleaf pine, white oak, Darlington oak, hophornbeam, southern magnolia, bigleaf magnolia, pyramid magnolia, cucumber tree, sourwood, tulip poplar, sweetgum, horse-sugar, American holly, florida anise, sebastian-bush, Elliott’s blueberry, silky camelia, witch hazel, wild ginger, partridge-berry, melic grass, variable panic grass, narrow-leaf sedge, hirsute sedge, striate sedge, and Christmas fern. The recommended management is to maintain a forest cover with as little disturbance as possible, avoid clear-cuts and thinnings, protect from fire, and minimize or restrict vehicular traffic. Due to the steep nature of the microhabitat, erosion is a constant threat, especially if thinning or harvest activities on the ridgetops are conducted in a careless manner. Adoption of Amendment 19 could result in increased removal of hardwood midstory and its associated leaf litter which could negatively impact this species in isolated specialized habitats with the RCW HMA. Direct effects on individual plants should be avoided by project review before specific clearing and burning activities take place.

Direct Effects – Although this species was not found during field surveys, not all harvest areas were inventoried therefore if individual plants do exist in areas proposed for timber harvest there could be plants impacted by this project, therefore there could be negative direct effects to this species.

Indirect Effects – Logging of ridges could allow an increase in sunlight to reach into adjacent bottoms and slopes in which this species grows, possibly encouraging its growth, which would be beneficial.

Cumulative Effects - This species is typically surveyed for in areas to reduce risk in order to lessen impact on individuals, but there is still a chance that individuals might have been missed by surveys. However, other known occurrences of this species have been given optimal protection and suitable habitats generally remain undisturbed. Therefore, cumulative effects should be discountable and are not expected to impact this species.

Therefore, action alternatives may “impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species. The no action alternative will have “no impact” on this species.

**Carolina fluffgrass** (*Tridens carolinianus*) is a native grass endemic to the Southeastern Coastal Plain and is considered rare. Like most grasses, Carolina fluffgrass is easily overlooked and underreported. In a 2002 survey of three compartments on the Chickasawhay Ranger District, a total of twenty-six new populations were found, twenty-one within the contracted area (Gulf Coast Biological Surveys, Inc.). In a wide ranging survey of the vascular plants of the Homochitto Ranger District, two populations were found by Chris Havran. Since Chris made no effort to maximize the number of records for this species and because of the ease with which new populations were found on the Chickasawhay Ranger District, it is certain that more populations on the Homochitto remain unreported.

The habitat reported for Carolina fluffgrass is grassy openings in well-drained pine-oak forests, typically old growth stands, mostly longleaf pine though occasionally in loblolly pine successional woodlands or in slash pine plantations. Oak species reported include southern red oak, blackjack oak, black oak, and less frequently water oak and bluejack oak. Groundcover is reported as diverse with bluestems, goldenrods, *Paspalums*, panic grasses, and asters to name only a few (Gulf Coast Biological Surveys, Inc.).

Carolina fluffgrass is a species of grassy openings in older pineland timber and seems to thrive best where soil disturbance has occurred: in old, overgrown firebreaks, in skidder trails, along woods roads, beneath red-cockaded woodpecker cavity trees where the undergrowth has been removed, old windrows, and other such areas of disturbance. The plants appear to respond well to fire, but not to shrub encroachment. Most colonies receive a few hours of direct sunlight (Gulf Coast Biological Surveys, Inc.).

Adoption of Amendment 19 would result in a small increase in burning and clearing of understory vegetation, modestly favoring growing conditions for this plant by reducing competition at the understory level, and increasing sunlight penetration to the forest floor. Consequently, the proposed direction would have indirect beneficial effects. There are no expected cumulative effects since the increase in burning and clearing is modest when compared to the burning and clearing regimes already in place, and not expected to incrementally affect the environment when added to past, present, or reasonably foreseeable future actions. Direct effects on individual plants should be avoided by project review before specific clearing and burning activities take place.

Direct Effects – The proposed action may impact individual stems negatively but the accompanying soil disturbance seems to encourage seed germination or other reproduction so the overall effect could be beneficial.

Indirect Effects – The proposed actions, specifically restoring the longleaf pine ecosystem with accompanying prescribed fire could allow an increase in sunlight and encourage spread of this species.

Cumulative Effects - The proposed project does not contribute to other unconnected actions within the forest to create unacceptable levels of negative cumulative impacts.

Because individual plants and habitats could be negatively impacted, it is my determination that the proposed action may “**impact individuals but will not likely result in a trend towards federal listing or a loss of viability**” for the discussed species. The no action alternative will have “**no impact**” on this species.

The **fetid trillium** (*Trillium foetidissimum*) has a wide range of reported habitat preferences: ravines, floodplains, low ground, in rich woods, even on roadsides and shoulders, in silts, sandy-alluvium, and loess soils. It is often locally abundant in rich soils on steep slopes in the shade of mixed pine-hardwoods and less commonly on low ridges, in well drained soils. The fetid trillium also occurs in floodplains in mixed hardwood forests. Associates may include: shortleaf pine, loblolly pine, longleaf pine, spruce pine, American beech, white oak, tulip poplar, bigleaf magnolia, pyramid magnolia, sourwood, flowering dogwood, witch hazel, American holly, red maple, Florida anise, Elliott’s blueberry, wild azalea, partridge-berry, long-leaf spikegrass, and yellow jessamine, green-dragon, jack-in-the-pulpit, wild sweet William.

The species seems tolerant of a wide range of soil moisture and soil types from low swampy woods to high, dry bluffs and ravine slopes. Fetid trillium was found by J. A. Smith “on all sites that I have covered during my endangered plant survey” (J.A. Smith, Pers. Comm., 1992a). They are considered widespread on the Forest and have been confirmed in the analysis area.

Adoption of Amendment 19 could result in increased removal of hardwood midstory and its associated leaf litter which could negatively impact this species in isolated specialized habitats with the RCW HMA. Direct effects on individual plants should be avoided by project review before specific clearing and burning activities take place.

Direct Effects – Logging activity may result in the loss of individual plants. However, implementation of streamside management zones and filter strips will minimize potential impacts to the fetid trillium.

Indirect Effects -- Potential impacts to the fetid trillium include the following: The no action alternative is anticipated to result in no change of habitat suitability for the fetid trillium. In general, excessive removal of the overstory or conversion of sites from mesic to xeric conditions may damage or destroy populations in upland situations. However, implementation of streamside management zones and filter strips can reduce potential impacts to the fetid trillium. Because streamside zones are the optimal habitat for this species it is not likely to be severely disturbed.

Cumulative Effects - Cumulative effects should be discountable and are not expected to impact this species.

The action alternatives “may impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species. The no action alternative will have “no impact” on this species.

The **ravine sedge** (*Carex impressinervia*) is a perennial sedge of the interior mesic deciduous forests of the Southeastern United States. The sites of the extant populations have been described as relatively open, mesic deciduous forests along small streams in ravines. Topographically, the areas are hilly and deeply dissected by streams that have created sheltered ravines. Hilltops support dryish pine forests and ravines harbor mesic deciduous forest. Within these ravines, the ravine sedge, occurs in the forest interior on floodplains or up adjacent slopes, but it is most common high in the floodplain and low on slopes at the transition between floodplain and slope. It may prefer small, narrow terraces in the bottoms where soil from the adjacent slope has fallen into the floodplain, thus creating a microhabitat just above the surrounding floodplain.

Ravine sedge survives only in local populations in a stable habitat, the interior of mesic deciduous forests in sheltered ravines in hilly regions. It grows with few other herbs and shrubs which implies that it is a poor competitor. It is apparently very rare and local, with most of the plants in a population concentrated into a small area. It requires habitats that are uncommon, sheltered mesic deciduous forests with low shrub and herb species diversity. The most serious threat to this species on National Forest land is logging, particularly through clear-cutting. This activity could compact soil, increase light levels, and drastically alter moisture regimes at the microhabitat level, making the habitats unsuitable for the ravine sedge. If logging did not directly impact this species, sediment from erosion and the spread of exotics could displace the sedge from its habitats. Adoption of Amendment 19 could result in increased removal of hardwood midstory and its associated leaf litter which could negatively impact this species in isolated specialized habitats with the RCW HMA. However, known populations are known and mitigations including fire exclusion are implemented. Direct effects on individual plants should be avoided by project review before specific clearing and burning activities take place.

Direct Effects – Although this species was not found during field surveys, not all harvest areas were inventoried therefore if individual plants do exist in areas proposed for timber harvest there could be plants impacted by this project, therefore there could be negative direct effects to this species.

Indirect Effects – Potential impacts include the following: The no action alternative is anticipated to result in no change of habitat suitability for this species. In general, excessive removal of the overstory or conversion of sites from mesic to xeric conditions may damage or destroy populations.



Cumulative Effects - This species is typically surveyed for in areas to reduce risk in order to lessen impact on individuals, but there is still a chance that individuals might have been missed by surveys. However, other known occurrences of this species have been given optimal protection and suitable habitats generally remain undisturbed. Therefore, cumulative effects should be discountable and are not expected to impact this species.

Therefore, action alternatives may “impact individuals but will not likely result in a trend towards federal listing or a loss of viability” for the discussed species. The no action alternative will have “no impact” on this species.

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## APPENDIX 1.

Threatened and Endangered Species  
National Forests in Mississippi  
1 August 2006 \*

Group	Scientific Name	Common Name	Federal Status	TNC Global	TNC State	Possibility of Occurrence on Homochitto NF
Amphibian	<i>Rana capito sevosa</i>	Mississippi Gopher Frog	E	G1	S1	Outside known range/no suitable habitat
Bird	<i>Grus canadensis pulla</i>	Mississippi Sandhill Crane	E	G5T1	S1	Outside known range/no suitable habitat
Bird	<i>Picoides borealis</i>	Red-Cockaded Woodpecker	E	G3	S1	Confirmed Present
Fish	<i>Acipenser oxyrhynchus desotoi</i>	Gulf Sturgeon	T	G3T1T2	S1B/S1N	Outside known range/no suitable habitat
Fish	<i>Percina aurora</i>	Pearl Darter	C	G1	S1	Outside known range/no suitable habitat
Fish	<i>Scaphirhynchus albus</i>	Pallid Sturgeon	E	G1G2	S1	Outside known range
Invertebrate	<i>Fallicambarus gordonii</i>	Camp Shelby Burrowing Crawfish	C	G1	S1	Outside known range/no suitable habitat
Mammal	<i>Ursus americanus luteolus</i>	Louisiana Black Bear	T	G5T2	S1	Potential
Plant	<i>Apios priceana</i>	Price's Potato Bean	T	G2	S1	Outside known range/no suitable habitat
Plant	<i>Isoetes louisianensis</i>	Louisiana Quillwort	E	G1	S1	Outside known range
Plant	<i>Lindera melissifolia</i>	Pondberry	E	G2	S2	Outside known range
Reptile	<i>Drymarchon corais couperi</i>	Eastern Indigo Snake	T	G4T3	S1	Outside known range/no suitable habitat
Reptile	<i>Gopherus polyphemus</i>	Gopher Tortoise	T	G3	S2	Outside known range/no suitable habitat
Reptile	<i>Pituophis melanoleucus lodingi</i>	Black Pine Snake	C	G4T3	S2	Outside known range/no suitable habitat

\* Bald eagle was removed 8 August 2007 as a Threatened Species by action of USDI F&WS and added the same day to Regional Forester's list of Sensitive Species.



**Appendix 2**  
**Forest Service Sensitive Species**  
**National Forest in Mississippi**  
7 August 2001 \*

Group	Scientific Name	Common Name	TNC Global	TNC State	Possibility of occurrence on Homochitto NF
Amphibian	<i>Plethodon websteri</i>	Webster's salamander	G3	S3	Outside of known range / Suitable Habitat Present
Bird	<i>Aimophila aestivalis</i>	Bachman's sparrow	G3	S3?	Confirmed Present
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G4	S1B/S1N	Confirmed Present
Crustacean	<i>Fallicambarus danielae</i>	Speckled burrowing crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Fallicambaarus gordonii</i>	Camp Shelby burrowing crayfish	G1	S1	Outside of known range / No Suitable Habitat
Crustacean	<i>Hobbseus attenuatus</i>	Pearl Rivulet crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Procambarus barbiger</i>	Jackson Prairie crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Procambarus fitzpatricki</i>	Spiny-tailed crayfish	G2	S2	Outside of known range / No Suitable Habitat
Crustacean	<i>Procambarus penni</i>	Pearl blackwater crayfish	G3	S3	Confirmed Present
Fish	<i>Alosa alabamae</i>	Alabama shad	G3	S1	Potential / At extreme periphery of range / No Suitable Habitat
Fish	<i>Crystallaria asprella</i>	Crystal Darter	G3	S2	Potential / No Suitable Habitat
Fish	<i>Etheostoma raneyi</i>	Yazoo darter	G2	S2?	Outside of known range / No Suitable Habitat
Fish	<i>Fundulus euryzonus</i>	Broadstripe Topminnow	G2	S2	Potential / At extreme periphery of range/ No Suitable Habitat
Fish	<i>Notropis melanostomus</i>	Blackmouth shiner	G2	S2	Outside of known range / No Suitable Habitat
Fish	<i>Noturus munitus</i>	Frecklebelly madtom	G3	S2	Outside of known range

Fish	<i>Noturus stigmosus</i>	Northern madtom	G3	S1	Outside of known range
Fish	<i>Percina lenticula</i>	Freckled darter	G2	S2	Outside of known range / No Suitable Habitat
Insect	<i>Alloperla natchez</i>	Natchez stonefly	G2	S2	Confirmed Present
Insect	<i>Atrytone arogos arogos</i>	Arogos skipper	G3G4 T1T2	S2S3	Possible / Habitat possibly suitable
Insect	<i>Haploperla chukcho</i>	Chukcho stonefly	G2	S2	Confirmed Present
Mammal	<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	G3G4	S3?	Confirmed Present
Mammal	<i>Myotis austroriparius</i>	Southeastern myotis	G3G4	S1S2	Presence Possible
Mollusk	<i>Anodontoidea radiatus</i>	Rayed creekshell	G3	S2	Outside of known range / No Suitable Habitat
Mollusk	<i>Elipio arca</i>	Alabama spike	G3Q	S3	Outside of known range
Mollusk	<i>Obovaria unicolor</i>	Alabama hickorynut	G3	S3	Outside of known range
Mollusk	<i>Plethobasus cyphus</i>	Sheepnose	G3	S1	Outside of known range
Mollusk	<i>Pleurobema beadleianum</i>	Mississippi pigtoe	G2G3	S3?	Outside of known range / No Suitable Habitat
Mollusk	<i>Pleurobema rubrum</i>	Pyramid pigtoe	G2	S1	Outside of known range / No Suitable Habitat
Mollusk	<i>Quadrula cylindrica</i>	Rabbitsfoot	G3T3	S1	Outside of known range
Mollusk	<i>Strophitus subvexus</i>	Southern Creek Mussel	G3	S2	Outside of known range
Reptile	<i>Pituophis melanoleucus lodingi</i>	Black pine snake	G4T3	S2S3	Outside of known range / No Suitable Habitat
Non-Vascular Plant	<i>Trachypodium heteroicum</i>	Trachypodium moss	G2G3	S1	Confirmed Present
Vascular Plant	<i>Agalinis pseudophylla</i>	Shinner's false foxglove	G2?Q	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Agrimonia incisa</i>	Incised agrimony	G3	S3S4	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Amsonia ludoviciana</i>	Louisiana bluestar	G3	SH	Outside of known range
Vascular Plant	<i>Arabis patens</i>	Spreading rockcress	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Aristida simpliciflora</i>	Southern three-awn grass	G2	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Botrychium jenmanii</i>	Dixie grapefern	G3G4	S1?	Outside of known range / Suitable Habitat Present

Vascular Plant	<i>Calopogon multiflorus</i>	Many-flower grass pink	G2G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Carex baltzelli</i>	Baltzell's sedge	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Carex decomposita</i>	Cypress-knee sedge	G3	S3?	Confirmed Present
Vascular Plant	<i>Carex impressinervia</i>	Ravine sedge	G1G2	S1	Confirmed Present
Vascular Plant	<i>Cleistes bifaria</i>	Small spreading pogonia	G3G4	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Coreopsis nudata</i>	Georgia tickseed	G3?	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Crataegus harbisonii</i> (=C. ashei)	Ashe hawthorne	G1	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Crataegus triflora</i>	Three-flower hawthorne	G2	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Desmodium ochroleucum</i>	Cream tick-trefoil	G2G3	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Dryopteris X australis</i>	Small's woodfern	HYB	S1	Confirmed Present
Vascular Plant	<i>Juglans cinerea</i>	Butternut	G3G4	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Lachnocaulon digynum</i>	Pineland bogbutton	G3	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Lindera subcoriacea</i>	Bog spicebush	G2	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Linum macrocarpum</i>	Spring Hill flax	G2?	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Macranthera flammea</i>	Flame flower	G3	S3?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Marshallia trinervia</i>	Broadleaf Barbara's buttons	G3	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Myriophyllum laxum</i>	Loose watermilfoil	G3	S1	Outside of known range / Possible habitat
Vascular Plant	<i>Panicum nudicaule</i>	Naked-stemmed panic grass	G3	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Penstemon tenuiflorus</i>	White-flowered beardtongue	G3?	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pieris phyillyreifolia</i>	Climbing fetterbush	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pinguicula planifolia</i>	Chapman's butterwort	G3?	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pinguicula primuliflora</i>	Southern butterwort	G3G4	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Platanthera integra</i>	Yellow fringeless orchid	G3G4	S3S4	Outside of known range / No Suitable Habitat

Vascular Plant	<i>Polygala hookeri</i>	Hooker's milkwort	G3	S2S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Polygala leptostachys</i>	Slender spike milkwort	G3G4	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Pteroglossaspis ecristata (Eulophia ecristata)</i>	Giant Orchid	G2	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Quercus oglethorpensis</i>	Oglethorpe oak	G3	S2?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Rhododendron austrinum</i>	Orange azalea	G3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Rhynchospora crinipes</i>	Hairy peduncled beakrush	G1	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Rhynchospora macra</i>	Large beakrush	G3	S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Ruellia noctiflora</i>	Night flowering ruellia	G2	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Sagittaria isoetiformis</i>	Quillwort arrowleaf	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Sarracenia leucophylla</i>	Crimson pitcherplant	G3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Sarracenia rubra ssp. wherryi</i>	Wherry's pitcherplant	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Schisandra glabra</i>	Bay starvine	G3	S3?	Confirmed Present
Vascular Plant	<i>Silene ovata</i>	Blue Ridge catchfly	G2G3	S1S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Spiranthes longilabris</i>	Giant spiral ladies'-tresses	G3	S2S3	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Tridens carolinianus</i>	Carolina fluffgrass	G3	S3S4	Confirmed Present
Vascular Plant	<i>Trillium foetidissimum</i>	Fetid trillium	G3	S3	Confirmed Present
Vascular Plant	<i>Trillium pusillum</i>	Least trillium	G3	S1	Outside of known range / Suitable Habitat
Vascular Plant	<i>Uvularia floridana</i>	Florida bellwort	G3	S1	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris chapmanii</i>	Chapman's yellowed-eyed grass	G3	S2?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris drummondii</i>	Drummond's yellow-eyed grass	G3	S2	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris louisianica</i>	Louisiana yellow-eyed grass	G3	S3?	Outside of known range / No Suitable Habitat
Vascular Plant	<i>Xyris scabrifolia</i>	Harper's yellow-eyed grass	G3	S1S2	Outside of known range / No Suitable Habitat

\* Bald eagle was delisted as a Threatened Species 8 August 2007 by action of USDI F&WS and added the same day to USFS Regional Forester's list of Sensitive Species.

### Appendix 3

#### STATUS CODES

##### Federal Status

- E - Endangered
- T - Threatened
- S - Forest Service Sensitive

##### State Ranks

- S1 - Critically imperiled in state because of extreme rarity (very few individuals or acres) or because of some factors making it especially vulnerable to extinction.
- S2 - Imperiled in state because of rarity or because of some factor(s) making it especially vulnerable to extinction.
- S3 - Rare or uncommon within state.